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A Constructive Plan for the Organization and Administration of Junior High School Courses in Industrial Arts for Boys

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SOME of the major aims of the industrial arts work in grades seven, eight and nine are the enrichment of the general curriculum; the acquisition by the pupils of a somewhat limited degree of skill in the handling of the typical industrial materials, tools and machines, and the developing of interests in industrial occupations, with direct value in educational and vocational adjustment. The junior high school is the connecting link between the elementary school whose purpose is general and the senior high school whose purpose is largely vocational. It receives boys and girls of thirteen and turns them over at fifteen to the senior high school for specialization within a somewhat restricted field. Junior high schools should serve the dual purpose of fitting pupils for senior high school and of assisting them in selecting an occupation. It is, therefore, desirable that as much experience of prevocational worth be included in all junior high school courses as it is possible to provide under the limitations of time.

Definition of Industrial Arts.

Industrial arts is manual training made broadly educational. It deals with the transformation of raw materials into finished products employing the necessary planning, drawing and construction and involving a sufficient amount of related information to make all of the activities engaged in, significant.

The Industrial Arts Project.

Since the teaching of industrial arts in the high school cannot cover effectively the whole field of industry but must concentrate on the problems which are of immediate or anticipated value to the pupils it follows that such teaching must function largely through the projects which the pupils undertake. *An industrial arts project consists of a complete series of lessons which have taken into account the pupil's development and the necessary subject matter, drawing and construction involved.* Subject matter is the thought side. It includes information relating to materials, tools and technical operations as well as cultural industrial information. Drawing includes design and the freehand and mechanical representation of form requiring instruction in orthographic projection and other working drawings including lettering, perspective sketches and sometimes isometric drawing. Construction includes the preparation and combination of materials to the end that a new product may result. Industrial arts will be interpreted to include all drawing and design which functions as a part of an industrial arts project.

The drawing included should provide ample instruction in art in so far as art is to be considered as a part of the various industrial arts courses. This does not mean that art should not be taught as a subject in the junior high school. On the contrary it should be taught to boys as well as to girls as a subject which is used continually by both in solving the common problems of life. Art should also form a most significant part of the courses in industrial arts for boys and home economics for the girls.

Nature of Handwork.

Handwork should always result from a definite purpose calling for it. Whether it utilizes drawing or constructing, or merely the mixing of materials, it should be undertaken solely for the purpose of general education rather than to meet immediate vocational needs. Selection of operations and of the products resulting therefrom should be made on the basis of the broader *educational* values, as opposed to the purely *training* values although the training values should by no means be ignored.

Nature of Subject Matter.

The subject matter should include such general topics relating to the trades and industries as the following: the importance of the occupation under consideration; conditions of employment; permanency of employment; opportunities for advancement; occupational diseases and health hazards, sanitation, etc. *Safety First* and first aid to the injured should be considered as a legitimate part of the related subject matter which should also include some of the intimately related science, mathematics, materials, history and Eng-

lish. Mathematics for example should be involved whenever a need arises for its use. Drawing and design in like manner should be brought into play as occasion demands. Instruction in the care of tools and machines is rightly considered as coming within the range of subject matter. The most conspicuous difference between the earlier forms of manual training and industrial arts lies in this emphasis placed in industrial arts on subject matter.

It has been recommended that from fifteen to twenty per cent of the time devoted to industrial arts courses be given to the immediately related subject matter. This time should preferably be taken from the beginning of each period. *One subject matter period each week may well be substituted for two periods of shopwork provided a satisfactory textbook is used.*[1] The word, text, is defined to mean a book relating to the subject matter of the course in which it is used, to be purchased by or furnished to each pupil registered for instruction. When a special subject matter period is provided it is obvious that less time will need to be given to this phase of work in the shop course. A few minutes each day should be set aside in each shop period however for pointed thoughtful discussion and recitation. There is a kind of related information that can be presented effectively only by the shop instructor in the shop.

The Time Element.

There are two types of schools which must of necessity be considered in any state-wide scheme for intermediate or junior high school industrial arts. These are as follows:

(a) Schools in which the boys are required to spend 240 minutes or three 80 minute periods a week in industrial arts (drawing and shopwork) as a part of the general school program.

(b) Schools in which the boys specializing in industrial subjects are required to spend 400 minutes or five 80 minute periods a week in the shop and 200 minutes or five 40 minute periods a week in the drawing room.

(In institutions offering this special course provision should be made also for pupils not in the course. Such pupils may be allowed to receive instruction in industrial arts for 160 minutes a week or two 80 minute periods, or they may devote 240 minutes a week to industrial arts. See a, the paragraph above.)

A Tryout Scheme.

It is recommended that the socalled practical work for the intermediate school period should lay special emphasis on educational and vocational guidance. The instruction should acquaint the pupils with the advantages and disadvantages offered in the various industrial lines.

The pupils should be taken to visit manufacturing establishments, drafting departments, buildings in the process of erection, and other places where industrial work is being carried on. They should also be required to visit the junior high school shops if there are such. A schedule for these trips should be arranged in advance and the class should determine in advance the purpose of each visit. The pupils upon their return should be required to make a special report covering their findings.

Teachers of seventh grade boys must render all possible assistance to the pupils who find difficulty in making a choice between the general, industrial, commercial and agricultural courses. They should become in a sense educational advisors to their pupils. School records will furnish valuable data in determining a pupil's inclination toward certain kinds of work. Success in mathematics and drawing will often indicate an aptitude for industrial subjects.

The Planning of Courses.

At the beginning of each school year old courses should be reconstructed and new ones planned largely on the basis of an annual investigation of conditions obtaining in the schools and in the community outside. This investigation would point the way to a permanent articulation of industrial arts with actual industrial life.

A course in intermediate industrial arts is defined as an organized body of educational instruction prescribed or approved as such by the local school authorities and carried on for at least two 80 minute periods or the equivalent a week throughout the year.

The course should be organized about typical processes or jobs arranged in order of difficulty of execution.[2] Useful *products* should be selected to furnish experience in performing the necessary processes. Subject matter should grow out of the shop activities. When drawing is taught as a separate subject it should always be correlated with the construction work. It goes without saying that when drawing is taught as a part of the shop course it forms an integral part of it. Products should be constructed from the pupils' own drawings or blueprints, in either case.

In arranging a course the processes are listed first. These processes will determine the type of product to be assigned. Products should be simple and should demand instruction in the exact principles or processes which they are chosen to clarify or to emphasize. Products may be (a) complete in themselves, (b) parts of complete structures, (c) parts of class or community structures, or (d) drawings and designs.

All good outlines of instruction in industrial arts provide for:

1. Listing the processes or jobs common to the type of work.

2. Arranging the processes or jobs in an instructional order determined by their relative difficulties.

[1] One subject matter period should serve at least four single or two double periods of shopwork. A period is 40 minutes in length.

[2] Another plan, one which has considerable in its favor consists of beginning with the subject matter rather than with the jobs. It is much more difficult to carry out.

3. Listing a series of products (practical and useful if possible) calling for the use of the processes or jobs mentioned in 2. (This list will include drawings and designs as well as constructions.)

4. A description in outline of the operations (operation sheet) involved in the carrying to completion of each product.

5. Subject matter including the intimately related mathematics, theory and science and economics involved in industry study and in the construction and drawing, arranged in instructional order.

Outlines of instruction should be written in advance and a copy kept at hand for continual reference.

The diagram which follows will be found helpful to teachers in planning their outlines of instruction. It should first be worked out on a large piece of paper. When complete it may be easily reduced to manuscript form.

Type of Work.
(As Woodworking, Metalworking, etc.)

Processes or jobs	Products	Subject Matter

Suggestive Program.

Teachers will need to supplement their outlines of instruction by operation sheets prepared in advance of the daily lessons.

Sequences of Courses.

The instruction in all types of intermediate grade work should be designed to meet the general needs of the community for intelligent citizenship. The boys should be taught to think clearly along mechanical and industrial lines. Industrial insight of a general nature, understanding and appreciation and skill are the ends to be sought.

Courses of instruction should be organized and administered as a part of the regular intermediate grade scheme. In choosing the courses it is desirable to select the industries of the community which offer the greatest vocational opportunities and to plan the sequences accordingly. Among the trade groups best adapted to instruction in schools may be mentioned the metal trades, the building trades, the electrical trades and the printing trades. In one type of vocational school (general industrial) these groups of trades would be so presented as to enable the pupils to acquire a sufficient amount of usable experience and skill to make their immediate entry into industry possible. In the other type of vocational school (unit trade) the pupils should be prepared upon graduation to enter a specific trade rather than a group of trades. In both types the pupils would be required to devote half of each day to practical work which must be conducted on a productive basis. This time requirement alone would make it impossible for industrial-arts courses to qualify as vocations. There are other reasons why industrial arts education work cannot pass for vocational education. Among these are its dominant cultural aim, its limited contact with the trade, and its still more limited equipment.

From the above it will be seen that instruction in industrial arts in the common school is quite different from training in an industrial occupation in a vocational school. In the vocational school, courses are organized about groups of trades or about a single trade, as the case may be. In intermediate industrial arts, instruction is organized about certain types of work each involving their own processes, products and subject matter.

Junior high schools completely equipped with several shops, for offering a sequence of industrial courses should have no difficulty in providing for at least six types of work, while schools in the smaller communities equipped with a single shop may find it difficult to offer more than three types of work. The following distribution of the various types of work over the three years of the intermediate period is suggestive:

Grade VII. Printing.
Woodworking.
Grade VIII. Electrical Work.
Concrete.
Grade IX. Metal Work.
Automobile Mechanics.

Schools now offering courses in woodworking only may find it desirable to branch out gradually into other lines of work. Printing might be added during the present year. Next year concrete could be introduced, followed a little later by a course in electrical work. It may be deemed expedient by some of the smaller communities to confine the pupils to three types of work, one type for each of the three years. In no case should there be less than three types of work planned for the three-year period.

Summary Outlines of Courses.

The possibilities for worth-while construction opened up by such a scheme for industrial arts are great whether the number of types of work is three or six. If fewer than six types are considered the study of the fewer types will be made more intensive. The following brief outlines will indicate the range of subject matter which may be offered in connection with each of twelve important types of work:

Type of Industrial Work.	Subject Matter Relating to
1. Printing.	Composing, presswork, binding, engraving and lithographing.
2. Woodworking.	Bench woodworking, carpentry, machine woodworking, cabinet and furniture making, varnishing, painting and finishing, upholstering.
3. Painting and decorating.	Wood finishing. Interior finishing (floors, trim, ceilings, walls). Exterior work (house painting), automobile finishing, sign and scene painting.

4. Concrete.	Footing and foundation walls, sidewalks, curbs and gutters, troughs, posts, steps, boxes, culverts, roads and engineering work.
5. Brickwork.	Wall and corners, manholes, foundations, panels, piers, semi-circular arches, chimneys and fireplaces.
6. Metalworking.	Blacksmithing, machine shop, toolmaking, patternmaking and founding, structural steel work, sheet metal and automobile work.
7. Drafting.	The work of the draftsman and designer. Engineering and machine work and architecture. Orthographic projection including freehand working sketches and mechanical working drawings. Dimensioning and lettering. Drawing to scale. Titles, bills of material, notes and specifications. Penciling, tracing, inking and blueprinting. Isometric and cabinet drawing and perspective or pictorial drawing. Details and assembly drawings. Plans and elevations sheet metal drafting involving intersections.
8. Industrial Art.	Textiles, wall paper, jewelry, ceramics, furniture, architecture, machinery, illustration involving freehand and mechanical rendering. Pencil, charcoal, crayon, pen and ink, water color, oil color.
9. Electrical Work.	Related elementary science. Light, power and signal wiring, maintenance, storage battery work, automobile work, light and power work including general station work, switchboard operation, line construction, meter work, telephone and electric street railway work, electrical manufacturing.
10. Textiles and Clothing.	Carding, spinning, weaving tests for wool, cotton, linen, silk, bleaching and dyeing, printing and tailoring.
11. Baking.	Bread and biscuits, cakes, pies, crackers, candies.
12. Automobile mechanics	Two cycle and four cycle gasoline engines. Elements of ignition and lighting system for automobile gas engines for trucks and pleasure cars. Chassis, frame, axles, wheels, steering gear, transmision brakes.

Space will not permit here of an exhaustive treatment of the subdivisions suggested above. The work should be covered by shop talks and demonstrations if it is impossible for the pupils actually to engage in all of the work.

A Suggestive Program.

A possible shop and drawing program for the special students in industrial arts in a typical junior high school equipped with six shops (one drawing room included) is given below. This scheme offers a half year's course in each shop subject named. It recognizes in printing an excellent study for the transition period from the general work of the elementary school to the more specialized work of the junior high school. All of the instruction suggested in the program will be handled by the industrial arts teacher in the shop or in the shop, subject matter and drawing rooms.

The teacher of industrial arts should be a graduate from an approved high school who has pursued a two-year special teacher-training course in industrial work. Men possessing the above qualifications who have in addition had some practical experience in a trade are to be preferred to those possessing no trade experience. And yet trade experience is not to be made the most important criterion in selecting men as instructors. The ideal teacher of industrial arts is the individual possessing qualities which make for efficiency in shop management. He must be a man of broad sympathies and of refinement as well as a master of his special field. General culture and resourcefulness are more to be desired than skill in a trade although skill must be considered as an important factor.

Schools equipping for industrial arts should make provision either for a two-room or a multiple-room layout.

If a *two-room layout* is chosen it should consist of a shop with tool and supply-storage closet adjoining and a drawing room with storage closet adjoining, the drawing room serving the purpose also of a recitation room. Both shop and drawing room should be large enough to accommodate the necessary benches, cupboards, machinery, supply racks and other equipment needed. The supply closets should be sufficient to contain full length stock. If the drawing room is to be used for drawing exclusively the shop should be large

Suggestive Program.

Type of Work		Subject Matter	Drawing	Product
Grade VII		The significance of the work as revealed by science mathematics, history, English.		Products including to motivate and make clear the subject matter together with drawings and designs to aid in constructing and to motivate subject matter.
1st half	Printing		Page layout, dummies, poster designs, sign painting.	
2nd half	Woodworking	Excursions, investigations and assignments covering such topics as the following hygiene involved.	Furniture design, architectural details.	
Grade VIII		Significance of trades, permanency of employment. Opportunities, conditions of employment. Salary opportunities. Labor organizations, mental and physical requirements.		
1st half	Electrical Work		Diagrams, wiring layouts.	
2nd half	Concrete	Study of materials, tools and machines, technic of the work involving instruction in drawing and design and in combining and arranging materials in construction.	Architectural drawing. Topograpical drawing. Perspective sketches.	
Grade IX				
1st half	Metal Working		Projections of products. Perspective sketches.	
2nd half	Automobile Mechanics		Diagrams. Drawings for automobile parts.	

enough to include a section of floor space set aside for recitation purposes. This space should be sufficiently large to accommodate a teacher's bench, blackboard, bookcase and individual seats for all the pupils. The drawing room should always communicate directly with the shop.

If a *multiple room layout* is chosen it should consist of one or more drawing rooms and as many shops as the size and the needs of the community require. There should be one tool and supply storage closet for each shop or one closet opening into each two adjoining shops. In the case where several shops are maintained one supply room may serve two shops provided it opens into both. The shops should be arranged in units wherever this is possible, a metal unit, an electrical unit, an art unit, etc.

The following minimum requirements apply to all industrial arts shops and drawing rooms: (a) Floor space, for shop, 1,600 square feet; for shop with space for recitation, 1,650 square feet; for storage and supply closet, 100 square feet; for drawing room, 1,200 square feet; (b) Partitions: for walls separating all shops and drawing room partitions that can be moved easily if necessary should it be deemed advisable in future years to readjust the original layout; (c) Light and power: daylight from one side if possible. Large windows placed close together as in factory construction. Individual electric lights for all benches and machines if other system of lighting is not adequate. Outlets for all electrically driven machines. Wall sockets for lantern, and daylight proof curtains in all rooms used exclusively for art instruction; (d) Blackboard: Each shop and drawing room should have 80 square feet of blackboard; (e) Corkboard: Each drawing room should have not less than 80 square feet of corkboard.

COURSE IN BUILDING CONSTRUCTION

S. O. Werner and F. E. Lawshe, So. St. Paul, Minn., High School

BUILDING Construction as a trade course, in a general industrial school, has been offered in So. St. Paul, Minnesota, for the past three years. During each of the three years a small frame dwelling has been erected by the students as a part of the course of instruction.

A description of the methods that have been used in conducting these classes may be of interest to those who are offering similar trade courses or to those who are contemplating offering courses in building construction, either in all-day or part-time classes.

In tracing the development of the teaching of carpentry in our trade schools, the subject seems to have passed through four stages since it was first introduced. Briefly the four stages are:

1st. Building small models of houses or barns.

2nd. Making parts of a building, as window and door frames with full size materials.

1. LAYING THE LINING FLOOR.

2. PUTTING UP THE FRAME.

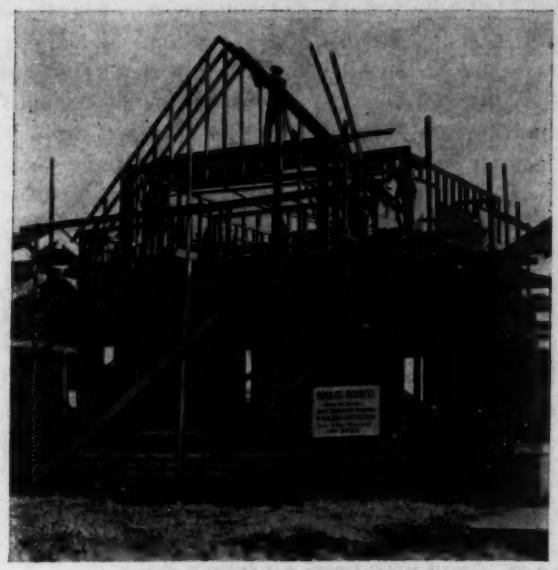
3rd. Building a section of the wall of a frame building somewhat reduced in height in order to show the method of construction.

4th. Constructing a completed building as a commercial product. We have based our course of instruction on the last method—constructing a completed building as a commercial product.

Description of the Course.

The length of the course covers two years and includes besides rough carpentry and interior finishing, the elements of several other trades, such as concrete work, inside wiring, brick laying and painting. The course is open to boys who have completed the eighth grade and who are over 14 years of age.

The school day is divided into two parts: one-half the day being devoted to manipulative work on the job, and the other half to related and academic instruction



3. RAISING THE RAFTERS.

in the classroom. With two groups of boys, two teachers devote all of their time to manipulative and related instruction.

It is the aim of the course to give to boys who have shown an interest in some branch of the building trade through try-out courses, training in building construction by actual experience so that they may go out after two years of training, better fitted to enter upon an apprenticeship in one of the building trades.

Financing the Project.

In order to carry out the productive part of the work, it seemed necessary that the course in building construction should follow as nearly as possible the method used by a general building contractor. Several plans presented themselves as possible means of financing the project. The one that we have found to work successfully has been to enter into an agreement with an outside party who desires a building erected, proposing that the school through its building construction classes do all of the carpentry work, the inside wiring and the outside painting, without financial remuneration. The outside party assuming the obligation to pay all bills for material and supplies.

After the first year we have had more applicants wishing to take advantage of our offer than it has been possible for us to accept.

How Carried On.

One of the first things required, preliminary to the building of the house shown in the accompanying illustrations, was the erection of a "ten by fifteen" sectional tool shed—made sectional so that it might be easily moved from one job to another.

This "shed" was fitted with a carpenter's bench and tool lockers. Each boy was required to furnish his own cross cut saw, hammer, try square and apron. These tools were of approved make and were regularly inspected by the instructor to insure good care. All other tools necessary were supplied by the school and kept in a separate locker and checked out as needed.

In building a house the work or series of jobs do not come in the order of their "doing difficulty." This was true at the very beginning. The actual carpentry instruction for the boys did not begin until the posts and beams that support the first floor joists were in place. Since this job required a degree of accuracy in measuring and leveling, the instructor—with the help of one or more of the older boys—did this job. However, from this stage on, all of the carpentry work was done by the boys.

A permit was taken out by one of the instructors for doing the inside wiring which, after completion, was inspected by a city inspector. In connection with the inside wiring, the proper placing of light and switch openings was discussed and afterwards drawn in on the plans. The right amount of candle power for each room was calculated, circuits were planned, materials estimated and the code requirements as to installation were thoroughly studied.

A part of the time was used for field work which consisted for the most part in visiting factories where building materials were manufactured, building and trade shows, planing mills and new buildings. The classes were made to feel responsible for knowledge gained and were given tests to cover this work as well as the other subjects.

It has been our practice to have complete sets of working drawings for each of the buildings. The boys were instructed to interpret freehand sketches made by the instructor to illustrate details not shown on the blue prints.

All the material as it arrived on the job was

4. SHINGLING.

checked by the boys. This helped to familiarize them with the kinds of building material, their names and uses, as well as training them in rapid estimating of lineal and board measure. The figuring and comparing of the amounts on the bills, against that received on the job, was made a classroom problem.

The Related Subjects.

The course in blue print reading covered twenty lessons and was given out in the form of typewritten lesson sheets, together with the blue prints for each lesson. All tracings for the prints were made by the instructor and the prints themselves were made by the students during the class periods. This proved a popular course and the actual making of the blue prints by the pupils themselves, was a good way to hold their interest.

The theory of mechanics and strength of materials was taught by means of a textbook, making the subject matter of the book follow as closely as possible the actual work of construction.

Applied mathematics presented no difficulties from the standpoint of maintaining interest. It consisted of problems in estimating materials from foundation to roof. Neighborhood problems were brought in from time to time,—such as estimating material for a new porch, cellar stairs, hen house, reshingling a roof, etc. The boy that brought in the problem was always proud to carry back the answer and, of course, was made to see the commercial value of the work he was doing. It was necessary from time to time to go back and review some parts of arithmetic, particularly decimals, fractions and square root. This was only a minor difficulty, however, and on the whole, the boys were very eager and intensely interested in this branch of the work and would often volunteer to take unfinished problems home with them.

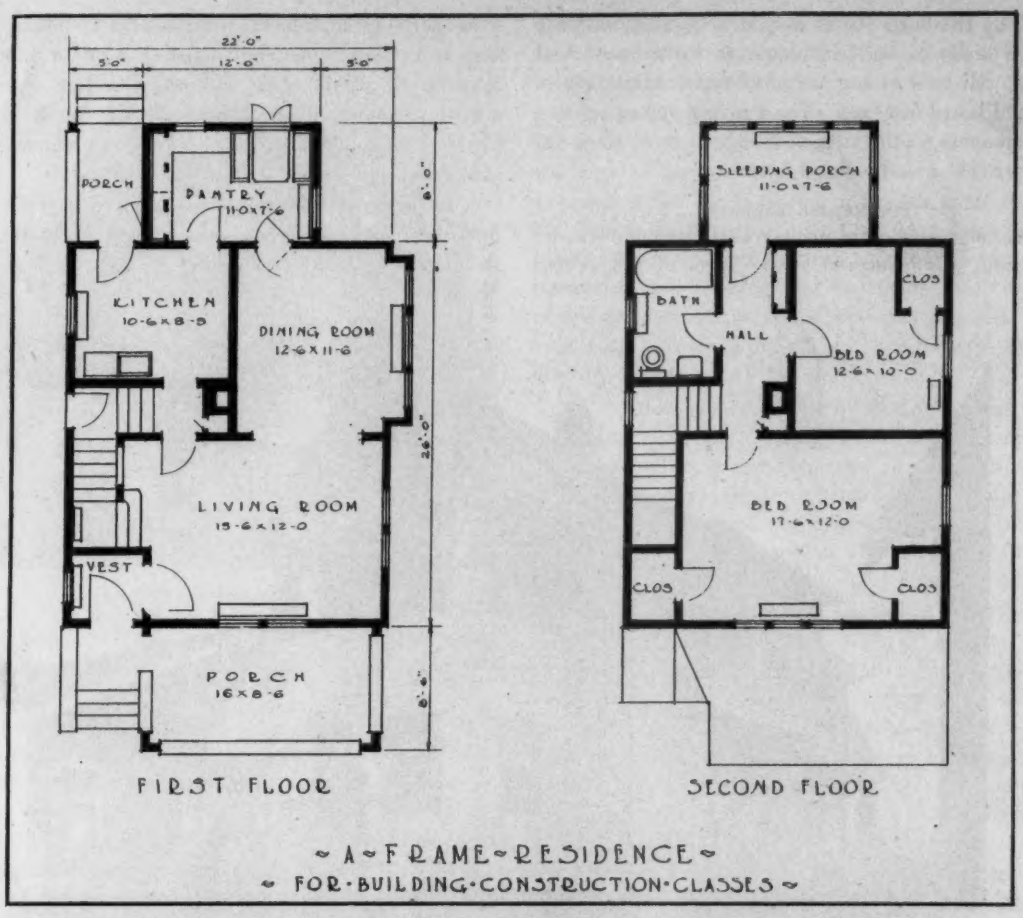
These three subjects were, as a rule, covered in the first year. Added interest was created by giving over the class period on every Friday to discussions on subjects outside of regular school work. Technical and trade magazines were kept on hand and the boys were encouraged to read them at odd times. These usually founded the basis of discussions and anything from marbles to the Einstein theory of relativity was not barred. If a discussion lagged or was slow to start, the instructor would fill in with a timely word of suggestion.

5. REAR VIEW OF FINISHED BUILDING.

Special Methods of Instruction.

The method of instruction, in most cases, was that of the demonstration method. In some cases, however, we found that the description method, combined with the demonstration method, was desirable.

One means of keeping the boys interested when there was any amount of repetitious work, was to create competition between individuals, groups in a class, or between classes. This was best carried out, for instance, in laying the lining floor, or nailing on sheathing, and it was found that this competition was invariably assumed by the boys themselves. It is, perhaps, the instructor's greatest problem at any time, to know how to encourage fast work and, at the same time, to have the



FIRST AND SECOND FLOOR PLAN OF THE BUILDING.

work done well. Another effective method of stimulating best efforts on the part of boys, was found in some cases, to have them work in pairs. Even when this had been accomplished, it was found advisable to make a change of the groups for a short period of time.

Every boy has a natural desire for certain kinds of knowledge to be gained in his own way; usually by observation and asking questions. There is no reason why he should not be given the opportunity in a trade school. The instructor, of course, must have a large general fund of knowledge and must, oftentimes, go out of his way to keep posted on the various subjects his class might be interested in. This, however, did not assume the proportions of an added burden, but developed into a fascinating game played by pupil and instructor with equal zest. Pupils were eager for knowledge and the instructor, filled with a new stimulus for dispensing knowledge, gave forth his best efforts. We have here the ideal condition under which knowledge should be gained and what a bright, little spot this grew to be for both pupil and instructor!

After the above method was successfully launched, there were fewer "drop-outs" the second year.

Conclusions.

In as much as it is very desirable that the house be "enclosed" before the cold weather starts, the project chosen should not be too large. A small house does not require as much scaffolding as a two-story building thus minimizing the element of danger. In either case however, as a precaution, it is advisable to have a guard rail built at the outer edge of each platform.

One of the greatest difficulties experienced in conducting a class in building construction with a mixed group of boys of varying ages, natural ability and experience, is the problem of keeping the less efficient ones busy. This is true —not only from a standpoint of production of commercially passable products — but also from a standpoint of efficient teaching. It is advisable, in order to elirainate this difficulty, to construct two houses, thus making it possible to place the efficient boys on the more particular work—such as inside finishing—and the less efficient boys on the second project to do the rough carpentry work.

Since every house must be a "commercial product" the work needs close supervision. When the ages of the students range from fifteen to eighteen, with a probable average of fifteen and a half years for the group, there should not be more than ten pupils in a class. Aside from the difficulty of teaching and that of disciplining when the classes are large, the work is not varied enough to keep the boys interested. The time allowed for

manipulative work should be in one period, rather than broken up into two sessions.

The house should be carefully planned to eliminate complications and should be built to weather the climate for which it is intended. It should be simple and pleasing in design, so that it will be a credit to the community where it is built, and as such, a monument to the boys who built it!

Summary.

One of the questions that naturally arises is in regard to the charge made. Upon careful inquiry both at the school and from individuals who have had work done, this has never been challenged. The extra fifteen per cent is necessary on the part of the school because of certain accidental breakage and natural wear. The instructor insists that students are quite as careful about careless breakage as under the old system where the pupil was required to replace tools if he accidentally broke them. Schoolmen of experience and also practical men realize that many pupils are unable to replace breakage, particularly when it is not entirely their fault, and without question this practice often leads to dishonesty.

Another question that naturally occurs is whether or not the garages object to the schools doing repair work, thereby taking work away from them. The answer to this is that when compared with the business of some twenty garages in Everett, the work turned out by the Automobile Gas Engine class even in a whole year is of no consequence.

In order to provide a graphic representation of the organization from the school board down, Fig. 4, has been included. This shows how the work is divided up and where the responsibility is placed. The success of this plan lies in the fact that it is founded on "team work" and those participating are given certain authority and held responsible for definite results.

Shop cards, daily time cards, etc., in addition to the business record system cards, are kept by the student workmen.

Organization and Administration of a Continuation School

E. M. McDonough, Acting Principal, Boston Continuation School

(CONCLUSION)

Instruction.

THE instruction given in the continuation school is naturally divided under three captions: First, vocational; second, prevocational, and third, general improvement. Seventy per cent of the minors attending continuation school in any large eastern city of the United States elect prevocational training, twenty per cent choose general improvement instruction and ten per cent pursue trade extension and trade preparatory courses. The instruction in all the courses offered is determined largely by the following factors which affect both the content of the course of study and the method of instruction:

First, attendance four hours each week, forty weeks per year, with the interval of a full week following each attendance.

Second, variation in previous academic education of the pupils. Some have only completed the sixth grade, while others have completed two years of high school.

Third, the noticeable difference in pupils from the same grade or school since some have obtained previous prevocational instruction in prevocational and trade schools.

Fourth, the initial entrance date into the continuation school which is determined entirely by the day the child procures an employment certificate, regardless of the school year.

Fifth, the entire student body are undergoing the unusual physiological and psychological changes peculiar to adolescence.

Arranging the curricula of the school to meet the specific demands of instructional progression in any given course is no easy problem. The solution of the problems presented in instructional, progressive part-time courses depends entirely upon the division of the subjects taught into class and individual instruction. Civics, hygiene, and commercial geography should be taught as classwork, since the subject matter naturally adapts itself to such instruction. Mathematics, English and the instruction given in all trades and commercial subjects should be entirely individual founded upon the previous scholastic training of the student and devised ingeniously to meet the specific demands of progress in the trade or commercial vocation which the candidate is pursuing.

The short-unit lesson is best suited to the instruction given in the part-time school. Owing to the brevity of time available for instructional purposes, shop projects are selected of a commercial character on which consecutively progressive commercial operations can be performed in from one to three unit lessons. As far as possible each lesson should constitute a unit in itself. A shop progress card on which each individual's progress is noted both on stipulated projects and in manipulative skill should be kept by each trade instructor.

The short attendance periods prevent the utilization of productive shop methods employed by trade schools. Instruction should always be given precedence to production, and every project or operation should be discarded as soon as its educative possibility is exhausted. In the last analysis the education of the child

should be paramount to the productive feature of the child's employment. This norm we have striven religiously to adhere to not only in our relations with the children and their employers, but also in the instruction in productive shopwork given in the continuation school. We teach the child only those operations which are consecutive and instructionally progressive in contra distinction to operations which from a standpoint of production would bring a monetary return to the school.

It is the boast of many trade schools that the production of the children pays partly for their education. We do not subscribe to this false philosophy in education and do not believe that the community is willing to impose on these children the obligation of paying for their education at the expense of exploiting their production.

Graded instruction sheets arranged according to difficulty should be employed in all academic instruction, especially in shop related work. Individual instruction will thus become a possibility and the individual child will be stimulated to progress and efficient work in his desire to excel. Arithmetic and English instruction clothed under the guise of related interest factors becomes animated and is eagerly pursued by the students. A pupil in the continuation school is interested in the postoffice department, savings banks, labor unions, and the opportunities open to employed children for promotion in the industrial world; and on the other hand would not be interested in Christopher Columbus nor George Washington, except during the weeks of October 12th and February 22nd. These children are intensely interested in Edison, Theodore Roosevelt, Woodrow Wilson, Hoover, Henry Ford and other men of the modern world who have contributed and are contributing immeasureably to the advancement of civilization and democracy.

There should be small classes in all part-time school work because of the individual character of the instruction given and also because of the visitor work which is essential to efficient continuation school education. The maximum number of children in all general classes should be 22 pupils per teacher and in vocational classes eighteen pupils per teacher. Teachers should work in teams, one trade and one academic teacher, or two academic teachers constituting a team according to the character of the group to be instructed. In general improvement classes each team of teachers is held accountable for the attendance, instruction and follow-up work of 220 pupils weekly. In prevocational and vocational classes each team must account for 180 pupils weekly.

Typical program of instructors:

	Monday Hours				Tuesday Hours			
	8-10	10-12	1-3	3-5	8-10	10-12	1-3	3-5
Machine shop work.	2		2		2		2	
Academic		16		16		16		16
	Wednesday Hours				Thursday Hours			
	8-10	10-12	1-3	3-5	8-10	10-12	1-3	3-5
	2		2		2		2	
	16		16		16		16	

	Friday Hours			
	8-10	10-12	1-3	3-5
	2		2	
	16		16	

One teacher should be allowed for each 300 pupil hours of attendance weekly or 60 pupil hours of attendance daily. Teachers should be required to report the number of individual pupils attending each week, in order to facilitate the transfer of new pupils and to enable the director to anticipate consolidations and eliminations of classes when necessary. The organization of the different courses in a continuation school is dependent upon the numerical enrollment, which in turn is dependent entirely upon the economic law of supply and demand operating in industry. Business prosperity and depression is therefore measured by the enrollment in the school. Flexibility in organization in order to enable the administrator to consolidate and eliminate classes whenever necessary, and inaugurate new classes demanded by industrial conditions is imperative. A continuation school should have a head of division for each 1,500 pupils. The duties of this head of division should be administrative and supervisory. The direction of all placement and vocational work, supervision of teachers, and maintenance of cooperative relations with employers and parents should be the functions of these division heads. Rigid economy should be practiced in ordering supplies for all departments and in the utilization of the various materials used for production. The cost of Continuation School instruction per capita is approximately $15, in comparison to $85 for high school instruction and $45 for instruction in elementary schools.

Vocational Guidance and the Employment Bureau.

In addition to instruction invaluable vocational guidance and counsel can be given in the part-time school. This school is bridging over the transitional period between theoretical school life and the practical life of the business world and presents unusual opportunities for vocational direction and placement. An efficient employment bureau should be established in every Continuation School, for the vocational guidance given is particularly potent coming as it does at the crucial moment in the lives of these adolescents. Juvenile delinquency and non attendance at school can be reduced immeasurably through the operation and counsel of the employment department as it is a well known truism that an idle child is mischievous, whereas a working child is too busy for mischief. An exceptional opportunity is presented for pointing out the mistakes and failures which these children make in securing employment and their reason for discharge from work. At the moment when the impression of their mistake is especially acute, vocational guidance which points out the error and the obvious remedy, becomes extremely practical and beneficial. The injunction "Strike while the iron is hot" can be obeyed literally in all part-time instruction. Vocational guidance is one of the functions which the Continuation School is performing and consequently is rendering a service to the community in retaining and guiding these children through the critical period of adolescence

which occurs concomitantly with their severance from the conventional schools and entry into the industrial world.

Unemployed Children.

Children temporarily unemployed have the option of returning to the conventional school or continuing at the part-time school during the interval of their unemployment. If they elect to remain at the Continuation School they must attend class 20 hours per week while unemployed, and report daily to the Employment Bureau until a new position is procured for them. Children attending the out-of-work class are given instruction designed to increase their vocational information and are taught the value of the industrial and civic virtues of honesty, obedience, neatness, courtesy, punctuality, initiative, faithfulness and loyalty.

Blind Alley Employment.

The Continuation School through the guidance of the Employment Bureau is constantly urging the children to avoid blind alley employment and to better their status in the working world. The initial wage seems to be the lure which attracts these pupils and incites them to reckless choice of occupations as well as thoughtless abandoning of employment which offers opportunity for progression. This restlessness is one of the natural tendencies inherent in the child during the adolescent period and therefore must be controlled and guided as far as possible for vocational ends. That there is such a thing as the deadening influence of automatic work, that the labor of children is exploited and that there are "blind alley" and enervating jobs, is indisputable. While it is undoubtedly true as some educators will contend that the industrial qualities and character formation which can be developed in any position are equally valuable regardless of the type of position employed as a means to an end; still it is also true that there are positions in the industrial world which give no opportunity for advancement per se and which offer no avenue of escape from mental and physical fatigue which is deadening and positively non-educative. To guide these children out of the labyrinth of various employments into that job for which they are best fitted and out of the present lucrative employment which offers no advancement to a position less promising at the beginning, but more progressive and developmental in the future, is one of the aims of part-time education. How well this aim is being attained depends upon the eternal vigilance of the part-time instructors and the fund of vocational information which is imparted in part-time schooling.

Housing.

Continuation-School classes should be housed in central buildings situated near the business district, where the employed children work. The Boys' Division and the Girls' Division should be conducted in separate buildings. Classes are sometimes conducted in factories, mercantile establishments and retail stores in which the use of a room for instructional purposes is given to the city where the school is established and the teacher is supplied by the school authorities. These classes are a great saver of time and suit the convenience of employers inasmuch as they are conducted at the place of employment. They fail however to give the prevocational opportunity which is one of the functions of the part-time school and are not the best form of organization since instruction is sacrificed for expediency. A separate building for continuation school work and not scattered classes in various high school and elementary school buildings is vitally necessary for the efficient administration of a part-time school. The importance of continuation school education demands a director whose full time should be given to the solution of the pressing problems peculiar to this type of school. To attempt to impose these duties upon the already overburdened elementary and high school masters will merely result in the continuation school problem becoming a side issue, receiving the time and attention of the director only after his daily problems are ended. There are some who delude themselves into imagining that part-time education is not as important as the other traditional schools. The fact is that part-time education is equally important with elementary and high school education and should be given an equal place in the educational systems of America. Continuation schools are educating that proportion of the population who should have an equal opportunity to share in the benefits of the state in which they are living. "Who shall decide the drawers of water and the hewers of stone?" What justification is there for presupposing that those who enter employment because of poverty should be precluded from all educational opportunity in the state. Because a child is a failure in the elementary school or high school, due to the fact that the theoretical instruction of the average school does not appeal to him, it does not necessarily follow that this child will be a failure in life. The time has come for our schools to give that equality of opportunity which is characteristic of America and to all the inhabitants of the state—to give each child the opportunity to develop that which is best in him regardless of whether he still continues in the regular schools or procures employment and attends the part-time school.

Instructors.

Instructors are differentiated into vocational or trade instructors and non vocational or academic instructors. One trade and one academic teacher constitute a team in all pre-vocational and vocational classes. Trade instructors teach 28 hours per week and spend four and one-half hours in the upkeep of the shop making a total of 32½ hours weekly. Academic instructors are assigned to 20 hours of teaching and are held responsible for twelve and one-half hours each week of follow-up work. All vocational instructors are journeymen in their respective trades and have had at least

eight years of trade experience before qualifying as instructors. Academic teachers are graduates of an approved college or of an approved normal school and have had at least two years experience as teachers previous to entering the employ of the Continuation School. All instructors (trade and academic) are required to satisfactorily complete a course of training under the caption "Theory and Practice of Continuation Schools" conducted by the Massachusetts State Board of Education prior to their appointment as teachers. It requires at least two years for the average teacher to gain a mastery of the problems peculiar to part-time instruction and thereby attain their best efficiency as an instructor. In addition to the knowledge of the special problem in continuation schools which is a prerequisite for all instructors, part-time education requires a teacher of unusual vision, understanding of the adolescent, a highly defined sense of proportion, resourcefulness, imagination, sympathy, and all of the other qualities required in the most able exponents of the teaching profession.

Attendance and Non Attendance.

Absence from the continuation school must be made up. That is, each pupil who has failed to attend on his assigned day, unless he can furnish a certificate from a physician certifying to his illness, must report on some other day during the week and make up the schooling lost through absence. This requirement is in conformity with the state law which requires these children to attend at least four hours per week during their period of employment and twenty hours per week while unemployed. The employment certificate under which the child works forms an effective weapon to compel attendance. If a child persistently refuses to attend school his employment certificate may be revoked. Employment certificates are never revoked. The threat to do so is sufficient. When a child has been absent for two consecutive sessions without excuse, he is classified as a truant and the attendance department investigates the case. These children suffer much through illness and accident and frequently change their home residences. These conditions cause temporary absence from school. Attendance in the Boston Continuation School for the last school year 1919-1920 was over 96% and when it is considered that this included the entire enrollment of the school comprising 5,300 different boys and girls each week, this remarkable percentage of attendance can be appreciated.

Records.

Schooling facilities afforded to so many thousands of employed children entail the keeping of a large number of records and the expenditure of a great amount of time in clerical work. Accuracy in records is essentially important. One of the problems in Continuation School organization is to reduce this clerical work to a minimum. When a child is absent from school a notification postal card is immediately sent to the pupil's employer and also to his parent. An envelope record file is kept in the school office and each pupil has an individual envelope in which is kept the industrial and school record of the pupil. Information gained by the teachers in their follow-up work completely summarized on follow-up record blanks eventually are filed in these envelopes as are also the scholastic marks given to the pupils in their school work. These marks are recorded by the teachers three times a year in December, April, and June, and are available for the information of the child, his employer and his parents. When a pupil permanently discontinues his schooling either because he attains the age of sixteen years or returns to the conventional school or changes his city of residence, a permanent discharge record is filed for the pupil containing his entire industrial and school record. These discharge cards constitute a separate file catalog and are kept as the permanent Continuation School record of the child. Upon completion of 140 hours of satisfactory schooling in the Continuation School a child is given a certificate attesting to his successful prosecution of the course elected. These certificates which are difficult to obtain are valued highly by the pupils, and frequent inquiries as to the possibility of a pupil's obtaining this certificate are received from the children, their parents and their employers.

Group Activities.

Continuation School pupils should be impressed with the idea of self-responsibility in anticipation of their future places in civil society. Any student of psychology will admit that the adolescent craves that self importance which comes from imposed obligations and duties. We have purposely placed responsibilities on the shoulders of these young workers constantly emphasizing on them their duty to their city, to their neighborhood, to their employer and to their parents. The response which they give and willing co-operation which they lend in this work prove that our confidence is not misplaced. The extreme freedom from disciplinary measures, and intense interest shown by the pupils in their work is frequently remarked upon by casual visitors to the school. These children feel a sense of responsibility for the care and maintenance of their school and the general procedure in regard to school work. The co-activity of right with its corresponding obligations can here be strongly impressed on these pupils. Activities which tend to solidify gang spirit and group action are stimulated and encouraged, feeling as we do that these activities can only reach their fullest fruition when actually participated in by the pupils. We have urged inter-class discussion on the part of the children, having them assume the responsibility for its conduct and making them the real actors in the play. The debating clubs which are held in conjunction with school work and which serve as a wonderful stimulator of class effort and school spirit; the walking clubs, the swimming clubs, the thrift clubs, basket-

ball games, baseball games, all of these activities which are conducted under the direction of the instructor in charge tend to crystalize more firmly the school spirit of the children and emphasize the advantage of group action. The encouraging feature in all continuation school work is the fact that these children are so co-operative and willing to work together for the betterment of their school. We have a continuation school Bulletin, edited by the children, the continuation school orchestra, the glee club, the athletic association and the numerous other inter-school activities which are conducted entirely by the students. Continuation School pins purchasable at five cents each are worn by each student.

Assembly.

There is an imperative need for an assembly hall in all part-time schools. Assemblies of the entire student body should take place at least ten times a week in order to include the different groups. These meetings should take place during the last ten minutes of the session. Reputable business men, physicians, dentists and playground instructors should be invited to address the students and emphasize the qualities necessary for success in the business world and the need of health as a prime asset in industrial and civil life.

Education Given in a Continuation School.

The education received in a part-time school is of positive advantage to these children, their employers and the community in which they reside. The right ideals of conduct which are inculcated are of inestimable value to the state. The minor of today becomes the adult of tomorrow. Cognizant of this fact, the continuation school is attempting to purify the stream of society at its fountain source. Training given in a part-time school is avocational as well as vocational. The deferred as well as the immediate value of instruction is recognized and given place in the curriculum. Utilitarian and cultural instruction are linked together for greater efficiency and higher service to home, employer and community. If the continuation school can train these children to be solicitous concerning their health, their behavior and their vocational aptitude for employment, then the work of the school has been eminently successful. These should be the criteria by which all part-time work is measured and appraised. The continuation school is an institution typifying the real democracy of education. She has no aristocratic standards for admission. All employed minors are welcome, regardless of previous education, whether economic necessity or dislike for school work has caused the child to sever his connection with the elementary or high school. Some are typical, a few are morons, but the great majority are healthy, normal children compelled to leave school either because of economic necessity, or because the theoretical instruction of the average school does not appeal to their practical minds. Efficient schooling for this group of employed children constitutes the continuation school problem. The part-time school is cognizant of its limitations. It cannot make "a silk purse out of a sow's ear;" neither can it transmute a "blind alley" job into progressive employment. But it can transform its curricula to meet the requirements of the industrial world; guide these children to the intelligent choice of a vocation, warn them against the deadening influence of enervating work, and prevent them from augmenting the derelicts of human society. Her functions are to guide, counsel and instruct; to train the heart as well as the hand and head. She must force the sun of human sympathy through the black shutters which the hand of poverty has drawn across the windows of the tenements. She must train these children for civic and vocational efficiency. The continuation school is not a panacea for all the ills of the working world, but she is training for efficient citizenship, diminishing the ranks of the city's unemployables, preaching the doctrine of human sympathy above the grating roar of factory wheels, and throwing a ray of hope and inspiration into the lives of the working children of the poor.

CARL T. COTTER,
President, Western Arts Association.

At the 1921 meeting of the Western Arts Association, held May 3 to 7, at Peoria, Ill., Mr. Carl T. Cotter, Director of Manual Training at Toledo, O., was elected president of the association.

Mr. Cotter was educated in the schools of Toledo, graduating from the Central High School and from the Scott Manual Training School, one of the first manual training schools in the country. He was graduated from the mechanical engineering department of the University of Michigan, with the degree of B. S. (M. E.) and spent two years in manufacturing plants.

Mr. Cotter began his teaching career in the high school department of the Toledo University and Manual Training School. From there he went to the Hackley Manual Training School at Muskegon, Mich., as instructor in mechanical and architectural drawing, and after two years was made director of the school. He left this position to take charge of the department of manual arts in the Toledo schools in 1909, remaining until the present time.

PROJECTION APPARATUS

William V. Winslow, North Tonawanda, N. Y.

TEACHERS of mechanical drafting are familiar with the theory of orthographic projection. In all probability they have never examined an elementary textbook on this subject without observing illustrations of the "imaginary transparent box" into which an object under consideration might be assumed to be placed for the purpose of obtaining certain views in accepted relationship one to another. The usual relationship of views is that of the third angle. These views are as follows:

(1) A front elevation (front view.)

(2) A side elevation (side view) placed to the right of the front elevation.

(3) A plan (top view) placed above the front elevation.

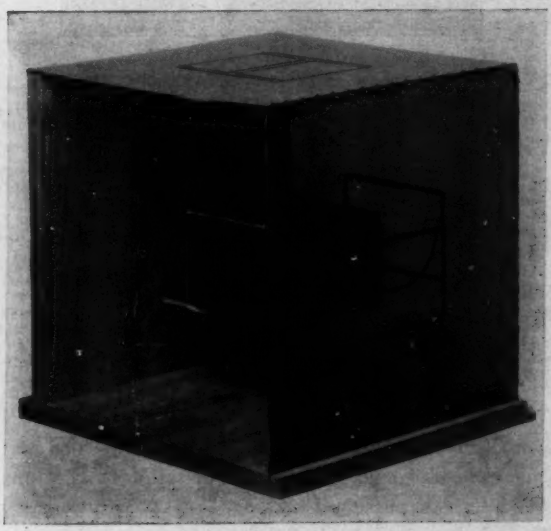


FIG. 1.

In orthographic projection these views are not only arranged as stated above but are coordinated in such a way that the corresponding parts check up. The relationship must be complete. How can the theory best be made clear to the student?

Probably the best way to put across the theory of orthographic projection is to make the imaginary transparent box a physical reality. The accompanying photographs show how this may be accomplished. Three transparent pieces of celluloid are laced together by means of fish line. It will be noted that these pieces are square and that one of them is inserted into a base board. Another board serves to give the box stability. Fig. 1 is a photograph of a projection box taken from the front and left side. It also shows how the back board of the box is inserted into a groove in the base board. Fig. 2 is a photograph taken from the front

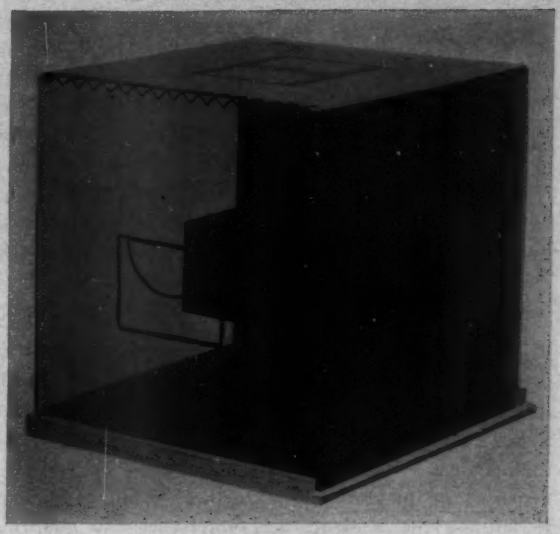


FIG. 2.

and right side of the box. Fig. 3 shows how models are set up. They may be placed on an individual standard with a block for support or they may be inserted directly into the base board of the box. Sometimes, however, it may be more convenient to place an object, a construction, or a machine part in the box with no standard.

Subject Matter for a Lesson Illustrating the Use of the Projection Box.

We have seen blueprints and we know how important these are to industry. It is an advantage to anyone to be able to read them. The theory of working drawing may be easily understood by means of a projection box.

The projection box consists of three transparent planes, two vertical and one horizontal. (Fig. 2.)

The object is placed in the box.

The front view is determined by bringing the points of the object straight out to the front vertical plane.

The top view is obtained by bringing the points of the object straight up to the horizontal plane.

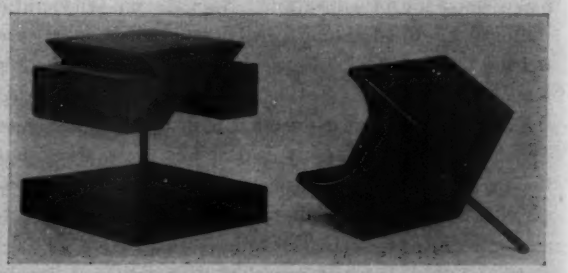


FIG. 3.

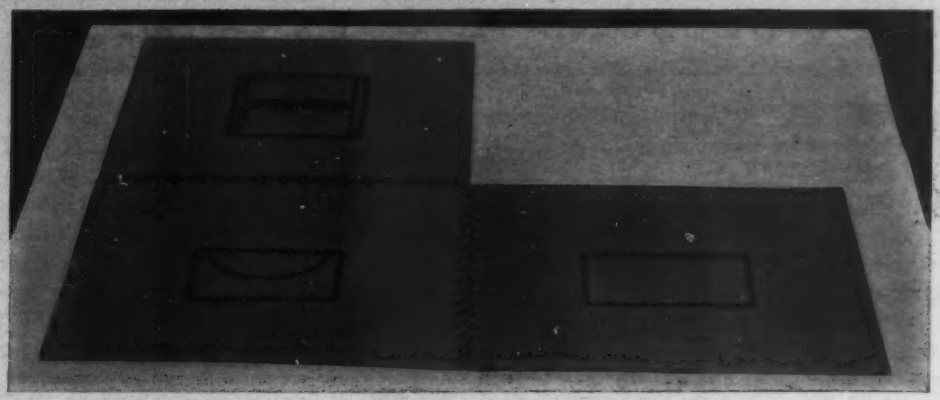


FIG. 5.

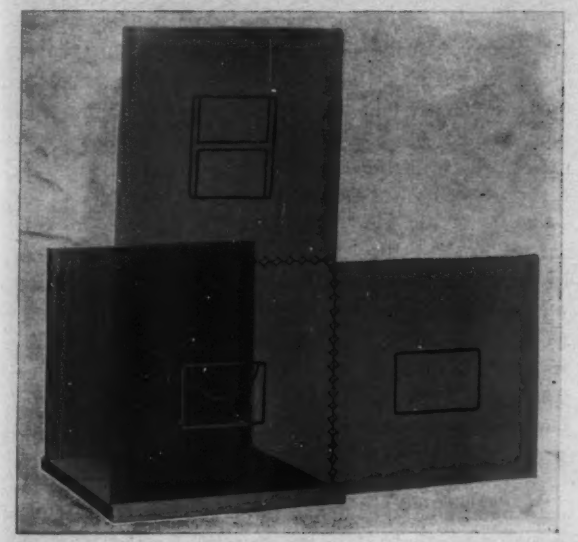


FIG. 4.

The right side view is obtained by bringing the points of the object straight out to the right vertical plane.

The horizontal plane is then revolved upward and the right vertical plane is revolved forward so that all three planes lie in the same plane. (Fig. 4.) This is the way the views are represented in a working drawing. They appear like this. (Fig. 5.)

The projection box should be used in the schools wherever working drawing is taught, that is to say, usually above the fifth grade. It will be found that a ten per cent solution of tincture of myrrh painted on the smooth surfaces of the celluloid will make it possible to draw directly upon the box with a soft blackboard crayon for the purpose of illustrating the views. Rosin dissolved in alcohol will serve the purpose equally well. Of course the solution must be allowed time to dry thoroughly before the crayon is applied.

Hidden lines are not represented in the early lessons. It is probably needless to say that in the grades technical terms should be avoided.

Upon trial it will be found that projection apparatus has an appropriate place in the elementary, in the high, and in the continuation and evening schools. The projection box should not be reserved for technical schools and colleges for it will explain and clarify ideas of working drawing just as surely as it will aid in the presentation of descriptive geometry. Why not use a projection box?

PRIZE POSTERS MADE BY PUPILS IN THE BUFFALO SCHOOLS IN CONNECTION WITH A CAMPAIGN FOR SAFETY IN STREET TRAFFIC.

SIX LESSONS IN COMPOSITION

Frederick Ames Coates, Prevocational Shop Instructor, Sherwin School, Boston, Mass.

EVERY teacher of printing, in no matter what type of school, comes very quickly face to face with a problem which exists in no other manual or industrial subject. The first step in the printing process, the prerequisite to all the others, and the one which remains of greatest importance throughout the course, is composition: the setting of type. Yet it is precisely in this first step that the learner encounters more difficulties, of manipulation, memory, and judgment, than he will be likely to come upon in any three-months' period later in the course.

For to set a single stickful of type, the pupil must know the "lay of the case," the proper method of holding the stick, the direction in which to set the line, the correct placing of the types with regard to nick, justification, paragraphing, and a host of other things, down to the use of ligatures and inverted commas. Furthermore, before he can proceed to the press, or even take a proof of his single stickful of type, he must learn the use of the galley, the difficult art of emptying the stick, and the method of tying the type firmly. A formidable program, indeed, for the beginner who is eager to 'print"!

Of these difficulties, the chief one—whether justly or not—is usually considered to be the learning of the case. The multiplicity of letters and other characters, in their apparently orderless array, is apt to appal the learner. Several methods, and variations upon them, have been used in schools—and in shops, for that matter—for teaching the case.

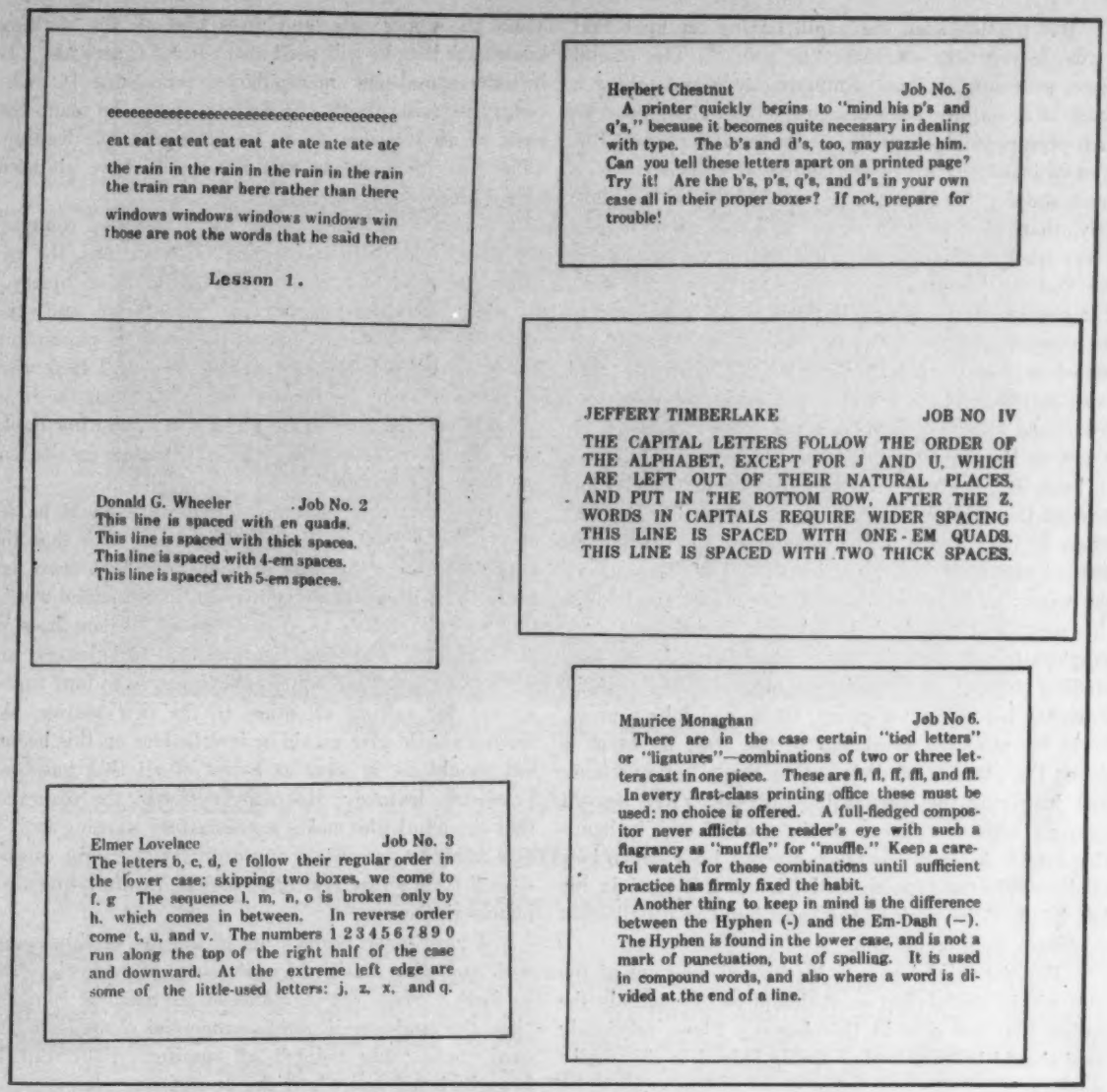
One method consists in giving to the pupil a lettered diagram of the case—or an actual case with the various characters marked on the boxes—and setting him the task of "learning" it; testing his purely memonic achievement later by questioning him on an unlabeled case. This is perhaps the most obvious method; but I think that anyone who has tried it will agree that it is a very unsatisfactory one. It gives to the pupil, at the very threshold of the fascinating field of shopwork, a false idea of similarity between printing and the very dullest of classroom subjects at its worst. It is not properly teaching at all: it is merely the setting of an onerous task, to which the learner is not likely to bring enough enthusiasm to achieve a commensurate result; and it is likely to form in him a distaste for composition which will persist.

Another way of teaching the case which has been very earnestly and seriously advocated, at least in Massachusetts, is to "place a stick in the boy's hand, give him his copy, lead him to the case, and leave him to his own resources." No doubt this will appeal much more to the average boy than the way first mentioned; but, even when preluded by a correct demonstration of typesetting on the part of the instructor, it is essentially a method of learning by making mistakes. The trouble is, the pupil is quite likely to make so many mistakes that he will become discouraged. Furthermore, it is altogether too easy to acquire incorrect habits, and too hard to eradicate them. What teacher of printing has not seen a pupil, even after considerable correct experience, trying to set the type from right to left in his stick? And it may fairly be questioned whether this method does not consume an unreasonable amount of time, even when it is successful; and so delay the complete conception of the printing processes which it should be the desire to give as early as possible.

There is, fortunately, a very wide middle ground, in which the large majority of teachers are probably working. What follows purports to be a description of such a middle course which I have developed into its present shape during several years of teaching printing. I claim for it no particular merit of originality: for some of its features I am definitely indebted to precursors in the field. But to the man who is beginning his first year as a teacher of printing, or who has not yet developed a satisfactory course, whether he comes from the trade or from the ranks of manual-training instructors, this may be of value as a very concrete program which can be relied on for good results, and may obviate that "floundering" which is always at the expense of the pupil.

In presenting the first lesson, the instructor shows each pupil how to hold the stick—and sees to it that he actually does hold it in the prescribed way. The case is then examined, and the disparity in the size of the boxes made a subject of attention. It may be worth while to analyze, previously, a page of any book, with an eye for the relative frequency of occurrence of the various letters; but if this is done, it should be done in the classroom—not in the pregnant atmosphere of the shop! At any rate, it is pointed out that the letter "e," being the most used, requires a larger box to hold the quantity needed. The instructor sets a few letters from the "e" box; then the pupil is directed to set an entire line of e's. In the almost certain event that the case is not perfectly clean, he will lay aside the wrong letters which he picks up; for he is to inspect the faces of the letters on placing them in the line, as well as the nicks. No proof is made of this line, nor of any of the lines in the first lesson. Obviously there is no justifying; no attempt should be made to tighten the line with letters. The lesson is to teach the location of the box; how to hold the stick; how to pick up and place the type. These three things are simultaneous: a fourth follows.

When the line is filled, the pupil is taught how to pick off the last few letters from the line with finger


eeee

But by this time the pupil, having set up actual words, is eager to see them "in print." The second lesson provides for this. Emptying type and taking a proof of it implies lines of equal length; and these in turn presuppose a knowledge of the various spaces. But even in justifying, there are degrees of difficulty. It is much simpler, for instance, to justify a line at one place only, than at a number of places between the words. Every line in Lesson Two is justified at a single place: the first in the center, the others at their right ends. The pupil uses some capitals (thus being introduced to the purpose of the upper case, though he is hardly expected as yet to remember any of the locations), and some figures. The l, p and c are added to his stock of lower-case letters by repetition; he also uses the q, u, k and m, the hyphen, and the period. The last-named, at least, he should remember. But primarily, he has learned the spaces: where they are, what they are for, wherein they differ. The one-place justification is learned under the individual instruction of the teacher; the names and size-relations of the spaces are told in the copy itself, and their relative thickness is very graphically portrayed in the finished job. As the concluding steps of this lesson, the pupil should be taught to empty his type on a galley, tie it, and take a proof. If in his attempts he should pi the type, no harm is done; the practice of distributing the pi, of re-setting and justifying the lines, will be of value; and he will gain an impressive lesson on the need of care in handling type. After he has taken a proof, he is shown how to distribute the type correctly, holding it level in his left hand. The work of the right hand in distribution is already familiar to him.

For the third lesson, a blackboard diagram of the case will be useful; but on it should be labeled only the letters that are new in this lesson. Those previously used should be by this time firmly lodged in the pupil's memory.

This lesson uses all the letters and figures in the lower case, the period, comma, colon and semi-colon. The text of it gives valuable hints as to their location which will help the pupil to remember them. Each boy should save his proof of this job for that purpose. And in this lesson he is introduced for the first time to complete between-the-words justification, for which his one-place justification of the preceding lesson has paved the way. He should be impressed, too, with the necessity for obtaining even spacing, and with the practice of using a larger space, generally an em-quad, at the end of a sentence.

The fourth lesson of the series is in some respects non-essential at this stage of the pupil's experience; but it capitalizes the curiosity which he has already acquired about the upper case, and gives him all the working knowledge that he will need about it for future use. It introduces no new manipulative processes. It sufficiently explains itself. If desired, it can be made the basis of an introduction to double and triple leading. (The preceding lessons would normally have all been single leaded.)

Lesson Five brings in the use of inverted commas, the apostrophe, both singly and in quotations, the exclamation point and the interrogation mark or "query." It also introduces paragraph indentation and the quadding out of a short line at the end of a paragraph. The text of this lesson may well be used, as I have used it, as an occasion for having the pupils clean the b, p, q and d boxes of their cases, which will almost inevitably have become mixed during the distribution entailed in the preceding lessons.

It is desirable that the sixth lesson should be set in fac-simile from reprint copy, to make sure that the pupil encounters the word-divisions, of which there are four. The other use of the hyphen, in compound words, is also exemplified, as is the use of the em-dash in punctuation. The five ligatures or tied letters are brought in here, each being used from two to four times. Except for calling attention to the new matter, the teacher should give no aid or instructions on this lesson, but should let it serve as a test of all that has been previously learned. He can do this in the assurance that the pupil who makes a satisfactory showing in it is now ready to proceed to any ordinary "straight composition" from either reprint or legible, carefully-prepared manuscript copy.

I have made no mention of the use of thin spaces with quotation marks, of wider space after a colon, and so forth. Since the introduction of machine composition, the tendency in most commercial shops is to discard these "fine points" of spacing. They can be brought in, if desired, at the appropriate places.

For further set lessons, no advice is here given. The exigencies of each particular shop: the product expected, the type of pupil, the time and equipment at the instructor's disposal, must shape the course from this point onward.

The merit which is claimed for these lessons is an orderly and gradual presentation of the difficulties which beset the beginner. Variations, if for any reason they are desired, will readily suggest themselves; but a word of caution in that regard may not be out of place. The prime consideration is the simplifying and minimizing of difficulties. An attempt to make the lessons more comprehensive than they now are is likely to result in vitiating the purpose for which they were prepared.

WEST INTERMEDIATE SCHOOL, JACKSON, MICH.

Household Arts in the West Intermediate School, Jackson, Mich.

Margaret Chambers, Cafeteria Director

WE often hear it said by experienced housekeepers that they never studied household arts, but could keep house and cook as well as anyone. This is likely true, but they do not take into consideration the general condition of the times. When these housekeepers were reared their mothers had only one interest—their home. Now mothers have many outside interests, such as clubs and voting, and many of the mothers work. It was the old-fashioned mother's pride and joy to bring up her daughter to be a good housekeeper. Today girls are taught more to think about preparing themselves to make their own living in office, store or schoolroom.

My experience in teaching evening school—dealing with girls above the school age—has proved to me that girls get very little teaching. Girls about to be married know very little about the making of a home. There are many things along this line that the public schools are not reaching. Household arts, if properly managed, can reach every activity in the every day life of the home.

Close observation leads me to believe that there are great possibilities in the further development of Household Arts. The directors of this work in the West Intermediate School of Jackson, Michigan, of whom I am one, have had many opportunities to develop new ideas, but as yet there are many undeveloped.

This school itself is perhaps the best equipped intermediate school in the country, and is especially well equipped in the household arts department.

The plan of cooking and sewing in the seventh and eighth grades is much the same as in other Intermediate schools. Cooking is required in the seventh-"B" and this is the only household art work that is required. Sewing is offered in the seventh-"B"; cooking and sewing in the seventh-"A"; cooking, sewing and serving in the eighth-"A" and eighth-"B."

In the ninth grade dress-making and cafeteria management and household management. This article deals only with cafeteria management and household management.

The cafeteria management has been under my supervision since the beginning, two years ago, and we have worked out many ideas that have proved very successful.

The cafeteria is a large, airy room, equipped with a very attractive steam table with a white marble top. The dishes are placed behind the table within easy reach and the ice-box is accessible also. The cafeteria kitchen is equipped with an electric dishwasher, potato parer,

potato masher, fan for removing heat and odors and other labor-saving machines. Superintendents that have visited our school have asked if we did not believe in teaching girls to pare potatoes. To this we reply that we certainly do, but that we do not think it necessary for a girl to pare three or four bushels a day to learn how.

The plan of work at the present time is to have each day three groups of about sixteen girls each. The first group comes at 9:45 o'clock; the next at 10:55, and one after lunch. The lunch is started by the first group and finished by the second. The group after lunch cooks food for the next day, and puts the kitchen in order. All groups are expected to wash all dishes and utensils used by them, and leave the kitchen in perfect order. The girls have charge of the kitchen at all times. They plan menus with regard to food value, learn how to use the left-overs and prepare all food used in the lunch. The only foods used that are not prepared in the kitchen are ice cream and white bread.

Each day one girl does the buying, learning in this way the cost of food and how to select it. The money taken in each day is counted and prepared for the bank, and one of the girls takes it to the bank and deposits it. Some of the girls have never been inside of a bank and do not like the idea of going, but after they have been there once and learned how to deposit money, they would like to go every day. The bank is interested in this plan and does everything to help the girls. When bills come in, the girls go over them and make out checks in payment.

A housekeeper is appointed in each group every day. She takes charge of the class, keeps an account of all materials used and price of each; sees that the kitchen and cafeteria are in order and that the girls do their work and are neat in appearance. Girls are marked on appearance and results.

The domestic science department furnishes one dish to the cafeteria once or twice a week, and the cafeteria either furnishes the material or pays for it.

There is no special serving group, all regular groups take turns in serving. This part of the work teaches courtesy, power to meet trying situations with ease, handling of money and many other things. All this is important and should be learned by all the girls. All the work of the cafeteria is so arranged that every girl gets a share in every activity.

This course is elective and the girls receive school credit the same as in any other course.

We feel that the advantage of this plan is that it gives the girls good training along many lines, and although the cafeteria is self-supporting there is no desire to make money, just so the children get a better lunch for less money.

The household management course has been tried in several different ways, but as yet we are not satisfied with it. The way I would like to see it tried is as follows:

In the West Intermediate school is an apartment, consisting of living room, dining room, bed room and bath. These are furnished with "Period" furniture and beautiful rugs. The apartment is very well suited to the course, except that a kitchen should have been added. All cooking is done in the domestic science kitchen.

The aim of this course should be to prepare girls for the future wives and mothers of our country, as ninety per cent of all the girls leaving school become home makers.

I would have the furniture removed from the apartment and have the girls come into an unfurnished house. The first thing taught should be how to furnish a home on a certain salary or amount of savings—some girls taking the average salary, some a little below, and some above. The same with the savings.

The only way to teach girls about furniture would be to take the girls to the furniture stores and let men that have spent their lives with furniture tell them something about it, with the furniture to look at. The cooperation of the furniture men would be necessary. but all whom I have talked with thought the plan fine. Girls should have tests on these visits to see what they get. They should also do some reading under the direction of the teachers. The girls should then select the furniture for the apartment and one of the local firms should be asked to lend it as an advertisement, and the girls should proceed to place it in the apartment. When the girls had time to arrange the furniture, several different ways, and had studied the effects, it could be returned and the furniture belonging to the apartment put back.

The expenses of the home should be considered—cost of food, light, gas, rent or payments on a house, insurance and fuel. In fact the budget of a house to meet the salary. Girls using the salaries considered in the first of the course. I think at this time it would be well to invite an insurance man to come and tell them how to insure furniture and clothes.

During this time the girls should be taught sweeping, dusting, bed-making, table setting, cooking and serving meals, care of bath room, table and bed linen, and everything that goes with housekeeping.

The next part of the course should be laundry work, washing and ironing—plain and fancy, white and colored clothes, table and bed linens—removal of stains, darning linen, dry cleaning and pressing.

Last but not least, I would give a course in the care of babies and sick room. The cooperation of the school nurse would be necessary. She would give some talks to the girls, telling them the things that it is necessary for them to know, teaching them how to wash and dress a real baby. Each group should make a complete layette within the reach of a certain salary. These layettes could be sold or given to some poor person. Infant diet is another important factor, and great care should be given to it. Care of the sick room in different

diseases, making beds for sick people, diet, preparing trays and a few things about the most common diseases that would help to care for them.

In fact the things that could be taught in the courses are too numerous to mention.

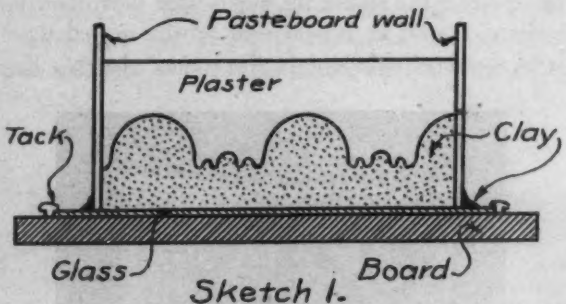
Every girl that goes through the intermediate school should be required to take it. If this course was properly taught with the cooperation of the local firms and the general public, we would see less of the divorce evil and more happy homes and strong, healthy, normal children.

Making Architectural Detail in Plaster of Paris

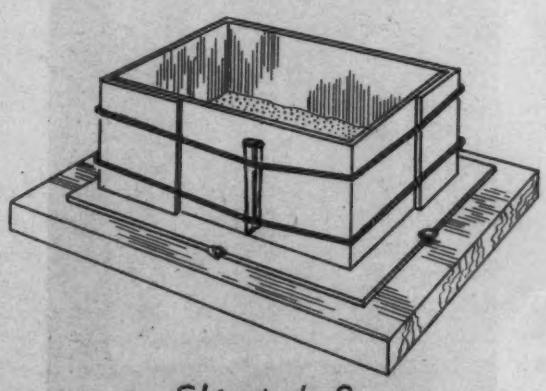
A Preparation for the Study of Modern Architecture. L. A. Herr, Lincoln School, N. Y. City

THE work described here is the result of an effort to find a phase of industrial-arts work that would be closely related to the history studied by a sixth grade class, and that would also help in the appreciation and understanding of some phase of the pupil's environment. School work is often dry and meaningless because it is too remote from the experience of pupils. Younger children particularly, are interested in the things they see about them. If these things are worth while, nothing will do more to arouse interest and to stimulate personal effort than finding out about them.

The history work to be covered by the sixth grade was the Greek, Roman, and Medieval periods. From the standpoint of industrial arts the question as to how man has provided himself with houses seemed a fitting one to accompany this study. The architecture of modern times, particularly that of the larger cities has received from these periods almost unbelievable contributions, many of which are unrecognized and unappreciated by few except architects and students of art.



Sketch 1.



Sketch 2.

FIG. 1.

FIG. 2.

Scarcely a public or private building can be found that does not have structural or ornamental features traceable to the work of the Greek, Roman, and Gothic builders. The class showed great interest in such features and other values of even greater worth grew out of the study.

Work began by making a summary of the kinds of houses used from the very beginning of history, noting the relation of these to the kinds of people, their occupations and environment. Following this, a more detailed study of Greek buildings was taken up. The Parthenon received especial attention. All of the pupils had seen the model of this building in the Metropolitan Museum of Art, New York, but after a discussion of the three orders of architecture and the characteristic details of each, another visit to the museum was made.

In preparation for the trip the class was asked to observe and report certain facts. For example, to count the number of channels on the shafts of Doric and Corinthian columns. The fact that the number was found different for each type, and that no matter from what source the example was taken, the number remained true to the type, proved a feature of great interest. Much enthusiasm was shown in pointing out examples of such detail as previous discussion had made somewhat familiar to the pupils and for which they knew the name.

When it was suggested to the class that they might make some ornaments resembling somewhat the examples seen in the museum, they were eager to begin. The children were told that three principal operations are necessary in making a cast, viz. (1) The model-

FIG. 3.

ing of the desired form in clay. (2) The making of a plaster mould from the clay model, and (3) The making of the cast from the mould. From a collection of pictures secured from the library, and from books, each pupil decided upon a type of historic ornament he wished to make. A full sized plan was then drawn on paper. With this as a basis the modeling in clay began. The aim was to make the ornament as true to the historic type as possible. Examples found in buildings, drawings, and photographs were constantly referred to during the modeling lessons. Running borders such as the egg and dart, bead and button, guilloche were favorites with a majority of the pupils; some, however, chose the antefix and the anthemion, and one boy insisted on doing a complete Corinthian capital.

Each pupil modeled and kept his work on a small board measuring about six by ten by seven-eighths inches. While fingers were the principal modeling tools used, the pupils were free to make use of any mechanical devices suggested to them by the character of their own work. Pencils, rulers, compasses, coins and other articles were at times found useful in obtaining some desired shape. This part of the work required several lessons. As there was no provision in the room for keeping clay moist, a zinc blue-printing pan belonging to the drawing department was used. A small amount of water in the bottom of this, together with a covering of boards and cloth made it a receptacle in which the clay was kept in suitable working condition.

When the modeling was completed the second step —the making of the plaster mould from the clay models —was begun. Pasteboard walls were placed around the clay forms to retain the liquid plaster while setting. (Fig. 1). In some cases a thin vertical slice of clay was cut from each edge of the model to secure more perfect vertical edges and square corners against which the walls were to be fitted. The walls were made of strips of cardboard cut wide enough to extend about two inches above the highest points in the modeling. These strips were then bent so as to form close fitting sides around the clay. Two strips each extending a little more than half way around the clay model, providing for double thicknesses at the corners, were found to be more easily managed by the children than one long piece. A piece of string was used to tie these walls around the clay. Small wedges made of rolls of paper or bits of wood were sometimes placed between the strings and the outside of the cardboard to keep the walls pressed close against the clay. (Fig. 2).

The pupils mixed and poured their own plaster, preparing enough for four or five moulds at one time. By this means little plaster was lost by setting before it had been poured. After about twenty minutes the plaster was hard enough so that the walls could be removed and the clay pulled from the bottom, leaving the completed mould of plaster. The fact that the mould is in form the reverse of the clay model was a cause of surprise to many of the pupils. (Fig. 3).

In the succeeding lessons the third main step, that of making the casts from the moulds, was taken up. The processes were almost identical with those employed in making the moulds. Walls of cardboard were now built around the plaster moulds. In some instances the strips of cardboard that had been previously used around the clay were found satisfactory for this purpose. Before pouring the plaster the pupils were shown how to make and insert hangers of cord or wire so that their ends would be imbedded in the setting plaster. The

FIG. 4.

danger of the wet plaster sticking to the mould and to the pasteboard walls, was avoided by brushing these surfaces with a mixture of soap and water before pouring. Moulds that were very dry were immersed in clean water until saturated before being used. The removing of the plaster casts from the moulds completed the work for some of the pupils. Others wished to apply some kind of surface finish to their pieces. For this purpose linseed oil, paraffin, white shellac, and paints were used according to the particular finish and surface desired. Figs. 4 and 5.

Several pupils brought from their homes various articles which they duplicated in plaster. One group whose work was among the first to be finished, prepared slip and showed how dishes might be made by the casting method; for this purpose one-, two-, and three-piece moulds were used. All the members of the class had had some experience in building pottery by hand and many understood the use of the potter's wheel. Thus a foundation was laid for the understanding of processes, later observed in a visit to a porcelain works. This visit coming shortly after the work with the plaster had been completed proved to be a most valuable one, because the pupils had had actual manipulative experiences with both plaster and clay, and were therefore, well prepared to understand the processes and mechanical devices they saw in use.

A part of several class periods was given to the hearing of reports by pupils. These reports were usually prepared by consulting books in the library and at home. Instead of a formal assignment by the teacher the class was asked to suggest points in relation to plaster that they wished to know more about. After this was done two or three volunteers were assigned to report on each topic. Such questions as the following were discussed: What is plaster? What countries produce it? How is it obtained? How is it prepared for use? What are the principal uses of it?

Aside from the regular classroom work there were many interesting voluntary responses. It was a common occurrence for pupils of this class to say, "I have seen this or that kind of ornament or structural feature," making reference to buildings along the street or to their homes. One boy speaking to a guest in his own home said, "I have looked all over this house to see if I could find any egg and dart moulding." A girl reported that she had seen so many examples of a Greek border, that she thought she would make a list of the places where it was found, for "there must be miles of it." A boy, after the close of school, wrote, "I have found Tudor roses, some crockets and finials in the billiard room." He then drew another detail for which he did not have a name and added, "and an ornament that looks like this." The kind of intimate knowledge and interest in architecture revealed in these remarks would have been lost without the approach through concrete experience. The history content which stimulated this work gained, in turn, new significance as the contribution of these early periods to architecture became revealed in modern life.

The work described was completed within a period of three weeks, there being given to it approximately two one-hour periods each week. In addition to the results indicated above, the ground was prepared in a stimulating way for a later and more intensive study of architecture. The work covered in that study, and the procedure by which it was carried out, will be described in a succeeding article.

FIG. 5.

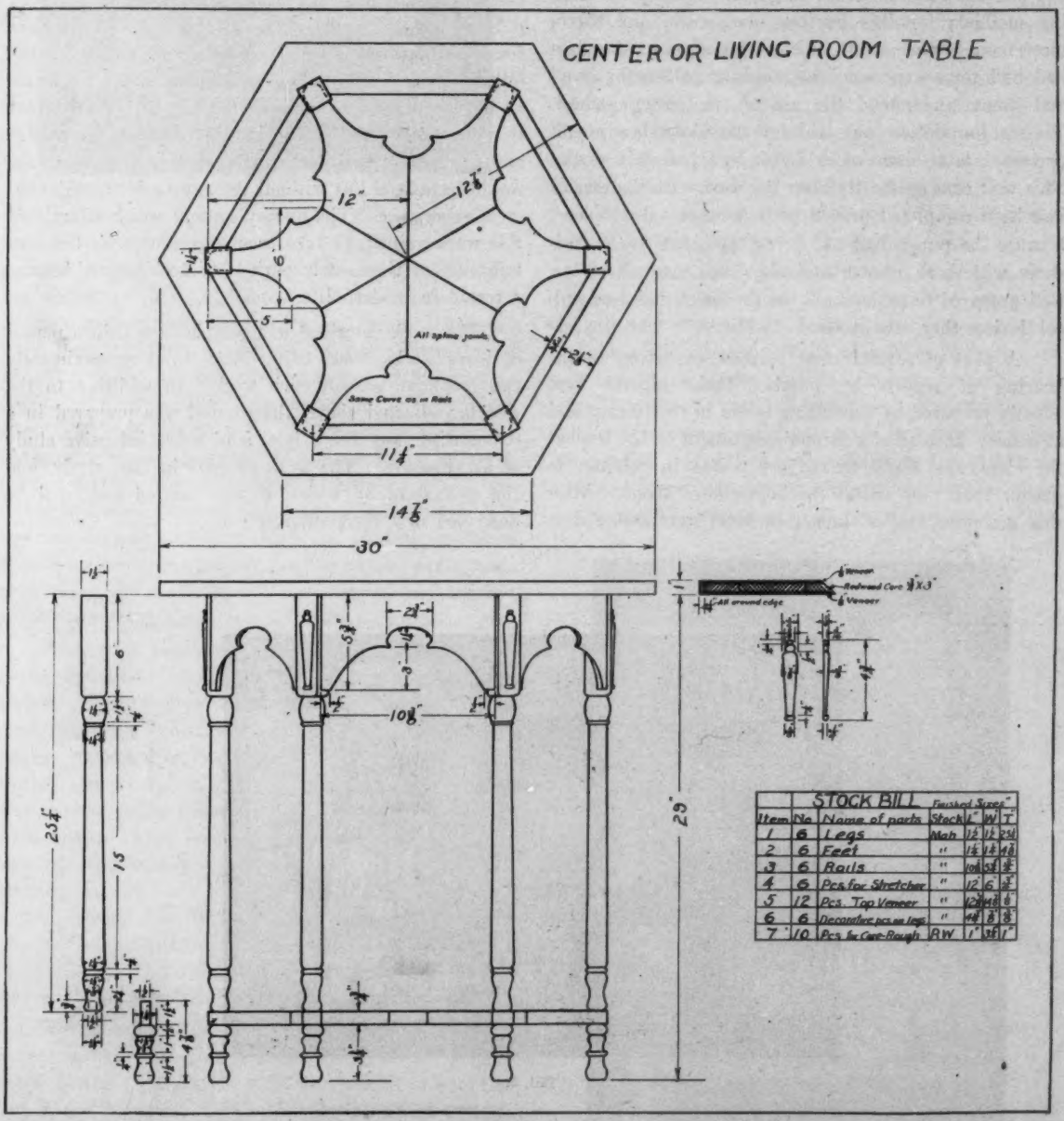
APPLIED TURNING

F. R. Love, Director of Manual Arts, Stockton, Calif.

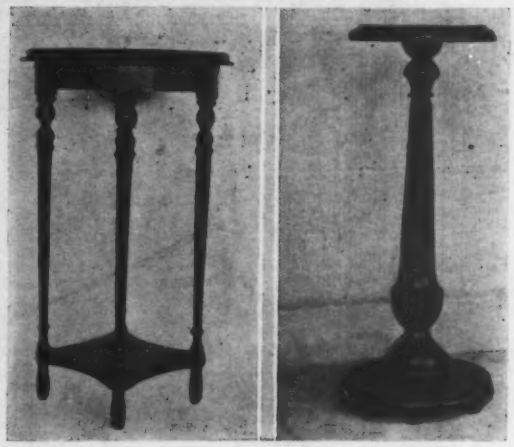
DURNING to the beginner is very fascinating. At first he is so much absorbed in mastering tool operations that he hasn't time to think about the utility of the thing that he is making. Just as soon as the lathe and tool operations begin to come automatically we find him getting more interested in what he is producing. After he has reached this stage, to keep on giving him exercises that are not applied to something useful starts at once a manifested lack of interest in the work. Whenever he can see that what he is making is to be used, you will never have to find an excuse for having any project in the course.

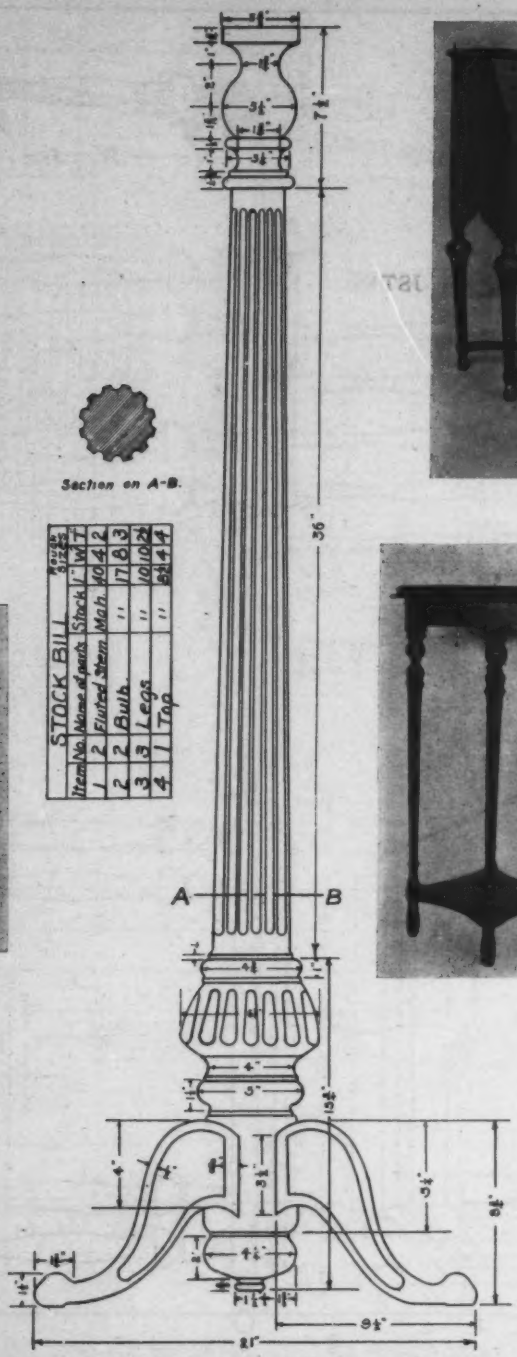
The trouble with most all turning courses is that too much time is put in on unproductive work. To overcome these objections in turning we have made our first year bench work and lathe work one course.

We begin our work on the lathe doing ordinary spindle exercises and apply these exercises immediately. Just as soon as possible we get to doing face plate



DETAILS OF CENTER TABLE. DESIGN AND DRAWING BY STUDENT.



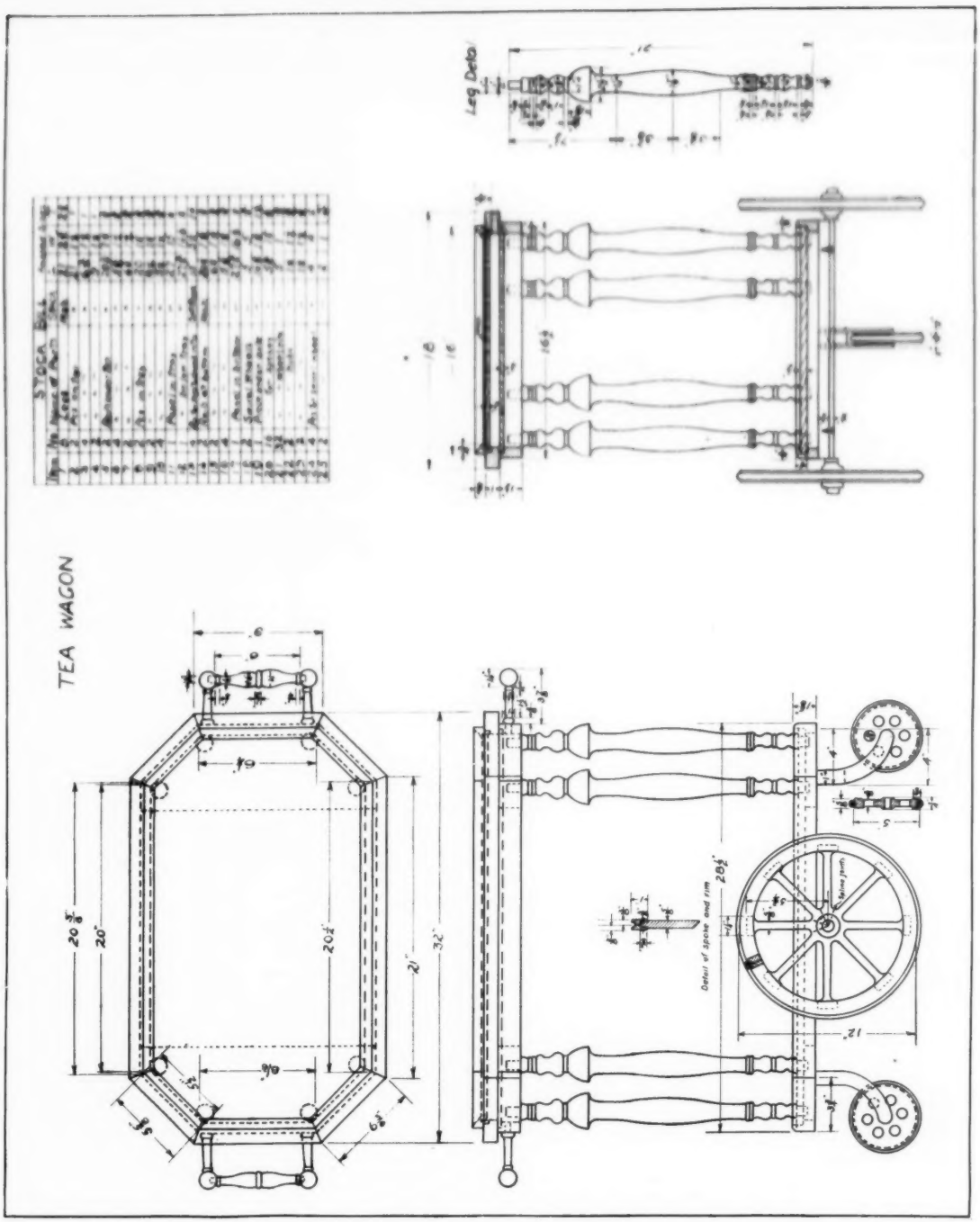


SOME OF THE FURNITURE PRODUCED IN THE AUTHOR'S CLASSES.

work. After a few exercises in both we give a project involving the two kinds of work. After this is finished the boy is given work in reproducing parts such as candlesticks, taborets, pedestals and stools. He starts on this simple work and works up into the more difficult pieces such as piano benches, chairs, tables, chevals, and tea wagons.

It is very interesting to see the number of turned designs that can be made for the furnishing of most any room. We have collected a number of good examples from commercial catalogs for illustrating to the boys the way turning can be applied to the furniture of these rooms.

For illustrating my point let us take a few examples: We will take the morris chair first. Whenever this chair is mentioned we generally think of heavy construction, mission design and very seldom think of having turned parts in it. The chair shown in this cut was made by a second year student and worked up without referring to a cut of any kind. In other words, it



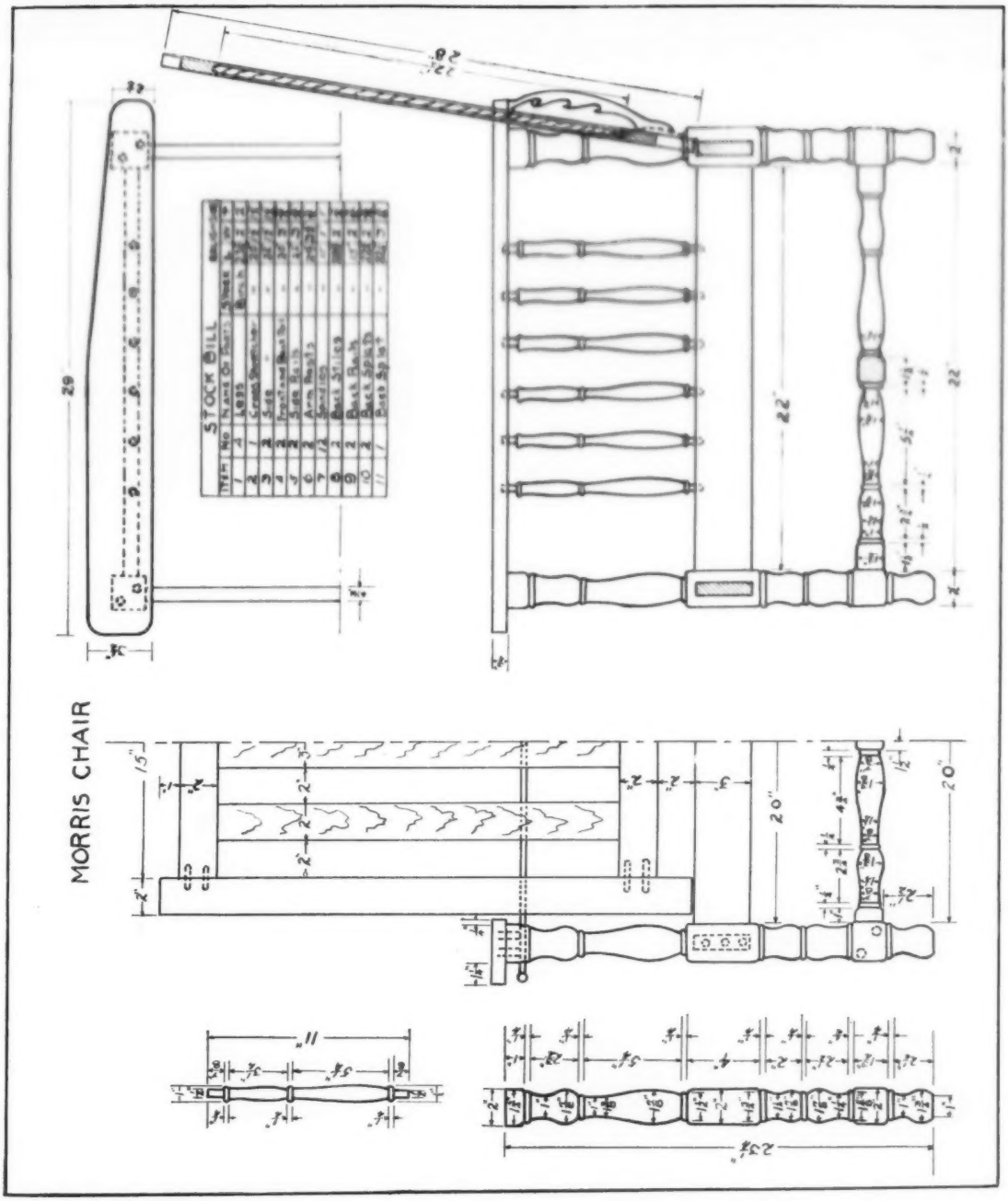
is as near original design as he could make it. The entire turning was done and the chair set up in three months.

The tea-wagon was made by a first-year student, the boy doing exceptionally good work for a beginner. The entire cart was made by him, including wheels and swivels.

The desk and chair was made by a Japanese boy in his second year of work. Both pieces were completed in one semester.

Table and floor lamps are always in demand. The lamp shown was made by a first-year student. The fluting on the lamps and pedestals were made by a special machine that we have to use in the lathe. The entire time for fluting never exceeds one hour.

I have tried to show in these different cuts the application of turning to a great variety of pieces. To begin with, we had to use all commercial cuts, but now we have both ours and the commercial to refer a boy to when he is designing a piece of any kind.



I do not believe that we have found one boy in the four years that we have been doing this work that has tired of either his bench work or turning. The variety in the work is great enough to keep him interested all the time.

Another advantage in having these courses correlated is that in the second year the boy may take either cabinet making or pattern making.

We are very much pleased with the results that we have gotten from this work and feel that if you are interested it will at least pay you to try it. You know in California that we are always ready to try anything at least once.

We teach a great deal of this work thru observation and assignments. A boy is given (for example) living room furniture. He is to observe the windows down town and if possible visit furniture stores and then report back to the class. It is surprising the amount of interest a class will show in this kind of work and the ideas they will pick up in design and period furniture. We make an effort at all times to acquaint the boy with the modern adaptations of period pieces.

We do not insist on a boy making a piece of furniture that requires turning. He is allowed to do all bench work the second semester if he desires. At least ninety per cent of our classes have chosen the turned pieces.

INDUSTRIAL-ARTS MAGAZINE

E. J. LAKE S. J. VAUGHN
Editors

EDITORIAL

THE SUMMER SCHOOLS WILL HELP SOLVE THE PROBLEM.

If the summer schools that offer industrial and vocational courses are not filled this summer, we have erred in our judgment of the thought and attitude of the special teachers. The new part-time school and the various other provisions of the Smith-Hughes law have laid great demands upon all who come into any sort of relations to this new legislation.

If we are not mistaken, there will be an unprecedented number of teachers and administrators in the summer schools seeking light on the various questions of school procedure which the new legislation has raised. In addition to these, there will undoubtedly be numerous teachers seeking assistance from those of experience in the problems of subject matter, part-time pupil personnel, class organization, methods of instruction, and other questions peculiar to the part-time school.

It is in these new fields of school work that both teachers and administrators are finding their most distressing problems. This summer of all summers is the time to gather together and to discuss, under competent direction, the experiences of the past year under the permissive mandatory provision, to point out the errors made, and to formulate plans, courses, and methods of procedure for the coming year. A very large degree of the success of next year's w in the vocational field depends upon the attendance of school teachers and administrators in the various summer schools.

THE LOST SHEEP.

From the various centers of vocational and Industrial teachers' training comes the general impression that the work is gaining favor among the teachers and school officials. This is a proposition which in no wise antagonizes the public school work as now organized, but seeks to bring those who have left school back to school work under instruction that is adapted to their interests. The various school subjects have definite application to vocational and industrial training. This must be conceded by those who are most concerned with the academic subjects for general educational purpose.

Language, mathematics, sociology, history, geography, etc., are essential to vocational and industrial training. The problem from the teacher's standpoint is to find the best application and presentation of these subjects to that great number of pupils who are not reached through these subjects when taught as part of a regular school course. Those who present this application do not presume to criticize the methods of instruction which have been or are now in use, but seek the best method of adapting these subjects to the specific interest and purpose of vocational and industrial training.

The mature teacher of one or more of these academic subjects is at once most apt to be antagonistic, and, at the same time, is in a position to be most helpful to such an effort. Supervisors have found greatest difficulty in soliciting the help and interest of teachers and officials of the organized schools. Now this missionary work seems to be progressing, and we may look forward with hope for that unfortunate and frequently illogical boy or girl who has fallen by the wayside. Let us not be so intent on the ninety and nine, that the lost sheep be neglected if there is any possibility of room in the crowded fold.

SOLILOQUY.

How did the past school year go with you? A place for everything, and everything in its place? Balance? Harmony? Uniformity? Regularity? Systematic, orderly procedure? Each day's routine carried off without a hitch or jar? Each week and month and the whole year so carefully planned and so precisely conducted that your plans needed no readjustment to the clock and calendar?

That would have been a wonderful year—if it had been possible; but it was not, and perhaps never will be. No! The work was noticeably behind at the end of the first month, a little less behind as the year advanced, and the spring weather and diversions ended with a considerable deficit. Next year we shall get a running start and do better.

This problem of education, like all other problems this side of the millennium, seems to undergo constant changes and needs constant adjustment. It is not uncommon to hear Mr. Old Timer refer to a time when things were very, very much more orderly. We are almost convinced as we listen to him that the millennium has passed and we are living in an age of turmoil and strife that can only lead to destruction. Then we learn that there are strong forces at work to systematize all the forces of nature and all the efforts of humanity. Some wise man seeks to pass a law dividing the year into thirteen months, because 52 weeks is divisible into thirteen months of equal size. Otherwise law makers will make us behave ourselves by removing all our temptations to do wrong. The whole world is to be so regulated by law that time, measure, money, and language will be uniform. Yes, surely the millennium is ahead and not behind us!

And then we wonder if that school year in which we are able to do all of the things planned without a hitch, is to be desired after all. What is to be the result of absolute uniformity, equality, and order? We are inclined to believe it will be absolute monotony. At least we are convinced that a world without new conditions and new problems to test our ingenuity and pa-

tience would be no place for a live, ambitious soul to live in. Let us be thankful for our many diversities, and the adversities which they bring. Let us be thankful for the ambition, energy and opportunity to contend with them.

SUMMER VACATION?

Reports come from the leading summer schools that many queries as to courses and conditions give promise of increased attendance over past years. This is indication of a revived interest in the teaching profession, which is imperative if our schools are to improve and progress. Summer school circulars come to us from New York to California, and the illustrations they present of beaches, playgrounds, and camps are quite as enticing as the summer resort circulars that announce opportunity for pleasure alone. Then, too, the cost of attending a summer school session for two months is no greater than the cost of attending a summer resort for one month.

Combined work and play is generally accepted as a great improvement over either taken separately. Added to the alluring opportunity for pleasure is the opportunity for improvement in professional ability and standing. The teaching profession is unique in this great opportunity to improve in health, vigor, and professional skill at the same time. Why should the summer schools not multiply and grow? Why should the teachers not increase and improve under such conditions?

There is but one reason—the underpaid teacher. Every school official should have in mind the necessity of every teacher spending several weeks of the summer vacation in a summer school. No school official should have in mind the employment of teachers for nine or ten months of service on nine or ten months of wages, with the prospect of the teachers rounding out a living income by earning what they can during the summer at some other occupation.

NEW METHODS OF WASTING TIME.

An instance is related where a well known schoolman took an hour and a half at a teachers' conference in describing in great detail some plan or scheme which he had been working on. He concluded finally with the statement that "it had all been a failure anyhow."

This is an example of some prolific sources of waste which are continually coming to light. It is all very well to carry on experimental work and to keep constantly striving for new and better plans and methods, but we are convinced that the most pressing thing needed now is to perfect plans and methods already in use and to increase the quality and effectiveness of the teaching.

The above instance is so nearly typical of the programs of teachers' meetings and associations that we are disposed to hold it up as a horrible example of what not to do. We know of no other one place where so much time is wasted as the teachers' association meetings. A good deal of the so-called "research" that is carried on and inflicted on over-patient audiences is the merest bunk. Some of it is no more significant than the counting of the nails in a keg. The only possible justification which one can give for consuming a large amount of time in a program is that he has a real contribution to make in the solution of a common and important problem. If he has disproved some commonly held notion, then his contribution is similar in value to the contribution of new facts, methods, and conclusions.

We must have experiment and research, but these are for the comparatively few. The big task is the doing of the daily job of teaching. And we still have a long way to travel before we can say that, generally speaking, our schools are taught in a highly skillful and expert manner.

WHY BOTHER ABOUT ART?

"Because a knowledge of Art can give you more pleasure than almost anything else. It can make you rich. It can give you a vista—and a vision. It reveals hidden beauty. It is like the window in the workshop that lets in the sunshine and gives a beautiful outlook—it makes life more worth while. It makes common things more valuable. A flower pot is worth a few cents, a bowl of the same clay a few dollars—a vase exquisitely formed and finely glazed or decorated sometimes hundreds of dollars. The difference between a kitchen chair and a Chippendale chair is a matter not of materials but Art. The cities of Europe are visited because they are beautiful—works of civic art. The artistic home is the one every one would choose. The difference is a matter of choice—taste. If you want to know how you must know about art. Art is one of the few things in the world that is permanent—the art of Greece is still the glory of that great nation. So is the art of Italy, of France. And France, which is known as the most artistic of nations, has lately proved herself most valiant, most courageous, most enduring. Art is a factor in the civilization for which the great war was fought and for which many gave their lives. It is for all. It enriches life, both for the individual and for the nation."—*American Federation of Arts.*

CHANGES IN ADDRESS.

Readers who will change their addresses temporarily for the vacation months or permanently for the coming school year are earnestly requested to notify the Circulation Department of the INDUSTRIAL-ARTS MAGAZINE.

The exact forms of both the old and new addresses invariably should be stated so that prompt and accurate mailing service may be continued. It should be remembered that complaints for non-receipt of subscribers' copies cannot be honored unless made within fifteen days after date of issue.

PROBLEMS AND PROJECTS

The Department of Problems and Projects aims to present each month a wide variety of class and shop projects in the Industrial Arts. Successful problems are invited and will be paid for. A brief description of constructed problems, not exceeding 250 words in length, should be accompanied by a good working drawing. The originals of the problems in drawing and design should be sent.

Problems in benchwork, machine shop practice, turning, patternmaking, sewing, millinery, forging, cooking, jewelry, bookbinding, basketry, pottery, leather work, cement work, foundry work, and other lines of industrial-arts work are desired for consideration. The editors will not accept the old hackneyed problems of footstools, taborets, towel holders, etc., which have been made from time immemorial, ad nauseum.

Drawings and manuscripts should be addressed: The Editors, INDUSTRIAL-ARTS MAGAZINE, Milwaukee, Wis.

CHILD'S BED.

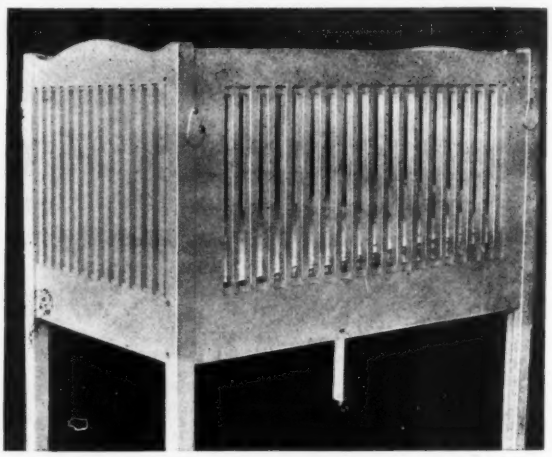
Howard R. Porter, Ellensburg, Wash.

The construction of this project is probably well enough explained by the drawing, but a brief description may aid. The material throughout is white pine. M. and T. Joints can be used throughout, though the bed shown in the photograph has the side rails held in place by means of screws put through the mortises and tendons from the inside faces of the posts, allowing the piece to be taken down for shipping. In placing the slats in the sides and ends, a groove was cut in the rails and the stub tendons of the slats evenly spaced with small blocks, glued in place. The tendons on the slats are most easily made by taking boards of good width, cutting to correct length and sawing one large tendon, after which the board is ripped into ¾" strips.

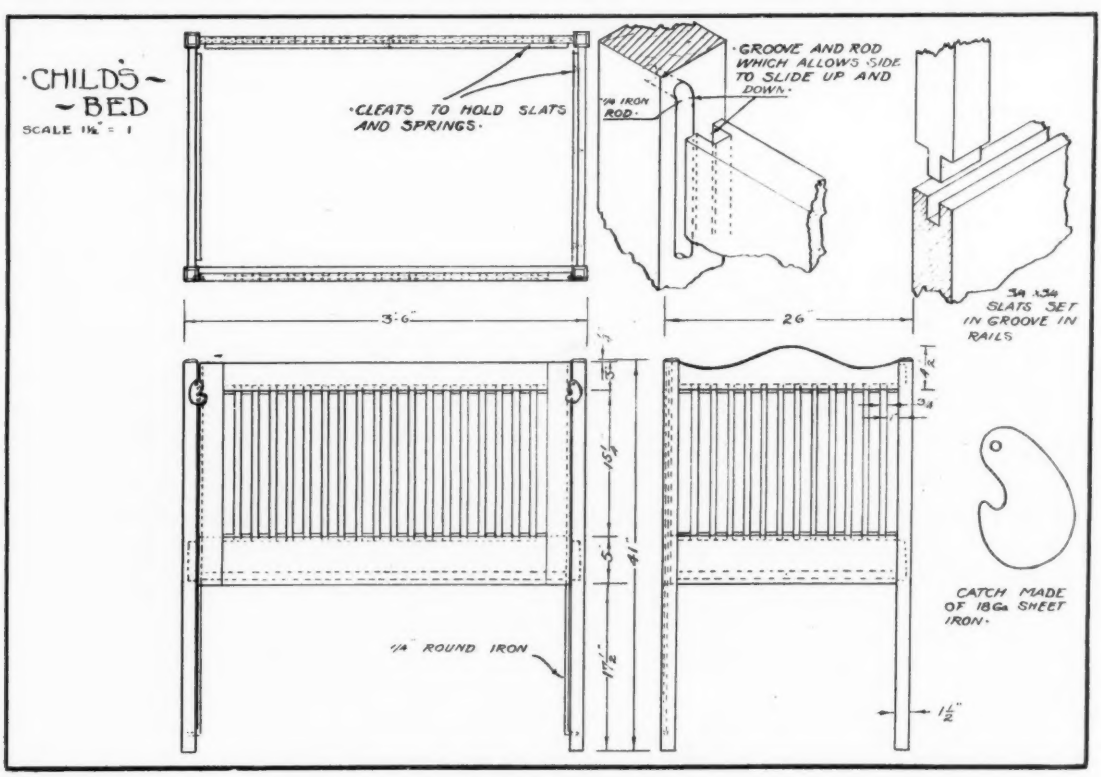
The front side of the bed which slides down to permit of easier access to the inside, is made as an independent frame. It has grooves cut in the ends which allow it to slide easily up or down on the ¼ inch round iron rod which serves as a track. This makes a much quieter arrangement than the one used on the manufactured article where metal slides on metal, and hooks rattle.

Two round head screws near the edge are caught by two sheet metal catches when the side is raised to its ordinary position. These catches, as shown in the drawing are shaped so that a slight upward lift on the side throws them outward and releases the side so that it may be lowered. The front side rail is placed just behind the movable side so does not show in the photograph.

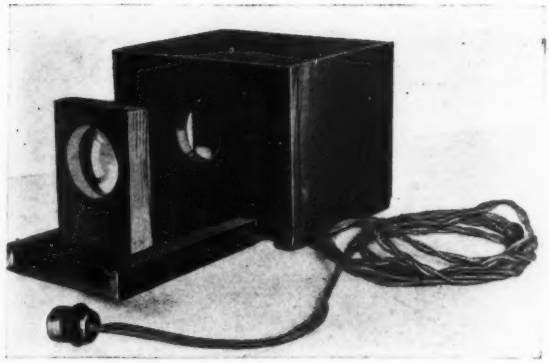
Cleats are fastened to the inside of the rails and slats to support mattress or springs resting on these.



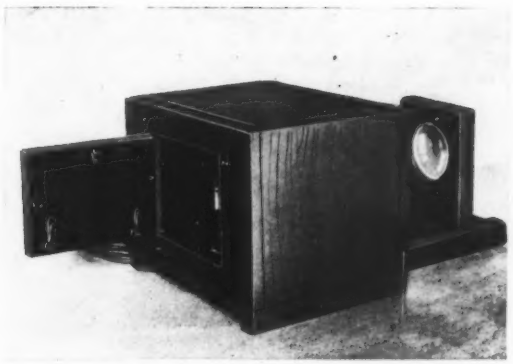
THE COMPLETED BED.



DETAILS OF CHILD'S BED.



FRONT AND SIDE OF REFLECTOSCOPE.
Note slide for focusing pictures.



REAR AND SIDE OF REFLECTOSCOPE.
Ordinary "paper clips" are used as holders for the pictures.

HOW TO BUILD A REFLECTOSCOPE.

Written by an 8th grade, Duluth boy, as a project in a General Science Class.

A reflectoscope is a very simple form of a magic lantern, only it doesn't need transparent slides, but will show postal cards, photographs, etc.

First make a wooden or metal box six inches high, six inches wide, and nine inches long. Three-eighths inch wood is best. The box must be light-tight. A door four by five inches must be cut in the back. Hinges must be put on the door so it will swing. Two paper clips must be fastened on the lower corners and another on the top. A bolt or screw will serve as a handle. In front bore a hole two and one-half inches in diameter. A piece of tin fixed as in A must be put in the two corners as in the diagram, and two ordinary tungsten electric lights in receptacles before the tin reflectors, wired as in the diagram.

Editor's Note—This reflectoscope was built by an 8th grade boy at a cost of $1.90, divided as follows:

2 receptacles	$0.20
1 plug	.20
10 ft. lamp cord	.25
1 convex lens	.65
Lumber	.60
	$1.90

The boy became interested in lenses while studying general science and found in some magazine a description of how to make a reflectoscope. The story tells in the boy's own words how he did it.

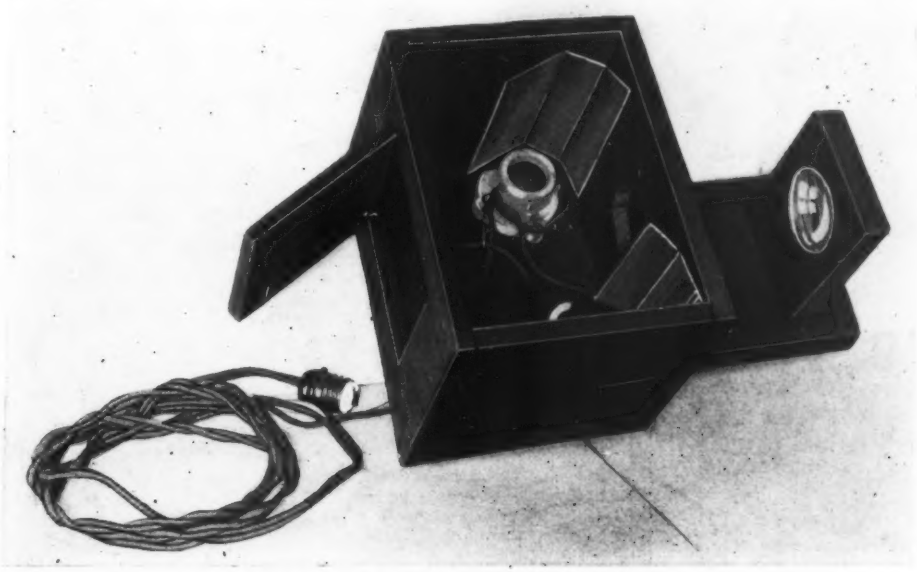
A board seven inches by five inches is made, then tack on each side a stick ¼ inch square by six inches long. Over this tack a stick ¼ inch thick by ½ inch wide by 6 inches long. Next make a board 4½ inches by 2½ inches, nail this on a board 3½ inches by 5 inches with a hole 2½ inches in diameter drilled through it one inch from the top. This will fit in the boards told about in the first part of the paragraph. I had a hard time to get the right kind of a lens, and tried to get one all over town. At last I had to send away to Sears, Roebuck & Company. A double convex lens 2½ inches in diameter is best, but you can use one from 2½ to 3 inches in diameter. Fit the lens in the board that slides back and forth so you can get the right focus.

Place a postal card in the clips on the door and then turn on the lights. Face the reflectoscope towards a white sheet and move the board holding the lens back and forth until the picture shows clearly. Large pictures will tend to blur at the corners, but this is on account of the lens, and cannot be helped.

FORGING A DRAW KNIFE.

Jay F. Knowlton, Junior College Shop Instructor, Hibbing, Minn.

The draw knife should be forged from a better grade of steel than our regular cast steel grade; however, very good results can be obtained from such grade if a little



VIEW OF REFLECTOSCOPE WITH TOP REMOVED.
The box measures 7" x 6" x 7"; the lens board is 5¾" high; the front opening is 2½" diameter; the rear door measures 5" x 6"; the front slide is 5½" wide.

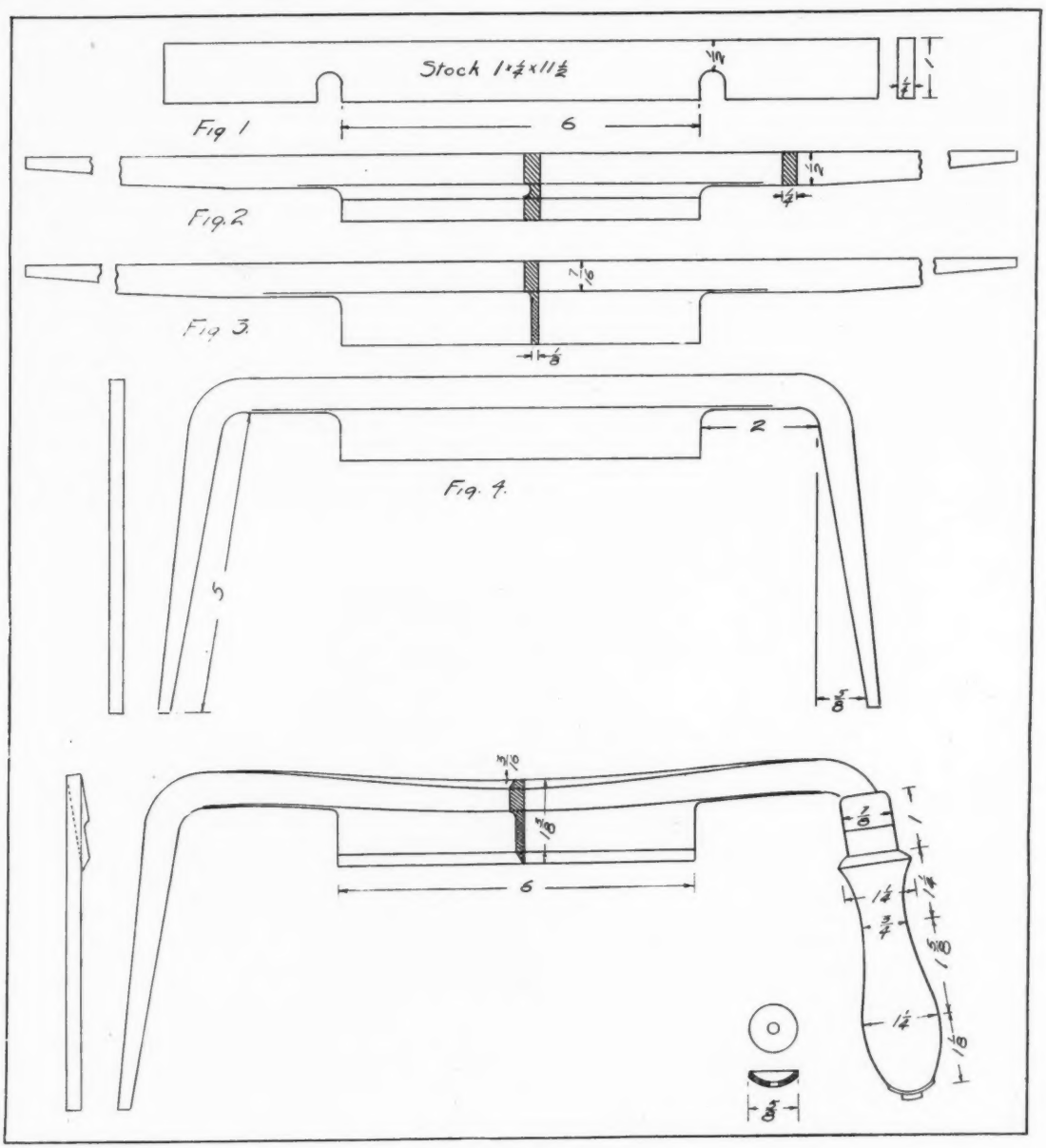
care is used in the finish hammering of the blade. If the blade is carefully worked it will hold a very good cutting edge.

The drawings show the method of forging a six inch blade draw knife. If an eight inch blade is wanted, simply add the two inches and forge the handles as shown.

The stock shown is one-fourth inch thick, one inch wide and eleven and one-half inches long. Start from the center of the stock and measure off the length of the blade, center punch and fuller as shown in Fig. 1. Now draw out the handles to size and note that they run one-fourth by one-half for two inches before the taper starts. The taper starts at the point where the bend will be made later. Leave the handles straight at present.

Now place the groove in the blade as shown in Fig. 2 with a fourth inch top fuller. This is the most difficult part of the work, as the groove must neither be too high nor too low, and at the same time it must be straight. If each handle has been carefully forged to one-half inch wide, little difficulty will be experienced. Start the fuller at each end first, then work to the center. Notice that the groove comes up in the handle a little and leave the back of the blade seven-sixteenth inch wide. The groove

THE COMPLETED DRAW KNIFE.



DETAILS OF DRAW KNIFE.

should be one-eighth inch deep, leaving the blade one-eighth inch thick.

The blade is now drawn out with a set hammer to the thickness required. This will cause the blade to curve backward which makes it necessary to straighten the back often. When finished, the blade has a little curve but it is better to have the blade straight until after the draw knife is ground and polished. The forging will leave the ends of the blade a little uneven, which should now be squared with a file, leaving the corner next to the handle round. The work should now be placed on a medium emery wheel and the rough hammer marks removed, after which it can be buffed on the 60 wheel.

Now see that the handles are the same size and length, and after marking the two inches for the bend with a center punch, bend the handles to the angle shown in Fig. 4. Now bend the handles back out of line with the blade as shown in the end view of the assembled drawing. The back of the draw knife can now be given the bend shown and the cutting edge can be filed straight. With a file or emery wheel, put on the three-sixteenth bevel shown on the back of the draw knife in the assembled drawing.

The wood handles can be turned on the lathe and a seven-eighth brass ferrule should be used as shown. After the handles are all finished there should be a three sixteenth hole bored through each, and the steel handles heated to a dull red and fitted into the wooden handle. This should be done slowly so as not to destroy the finish given the wood. The metal caps for the ends of the handles are made from sixteen or eighteen gauge soft steel or iron. They are cut into five-eighth inch round disks, raised with a ball-pein hammer over the hole in the anvil to fit the end of the wood handles and a three-sixteenth hole drilled through the center of each.

The draw knife should now be polished ready for tempering. The tempering is done by building a large long fire of coke into which the blade part of the knife is placed and allowed to remain without draught until it takes a medium red heat when it is quenched lengthways in oil. It is now polished and temper drawn either over a hot iron or the fire to the first shades of blue. The hot iron will no doubt give better result than the open fire as it is more easily controlled. Use a 1 by 2 piece and heat a sufficient length to draw the entire blade at one time. The back part of the blade can be drawn to a deep blue but the one-eighth inch thick blade must be stopped at the first shades of blue. The handles should be drawn until no temper remains including the part from the bend to the blade.

The draw knife should now be given a fine polish all over except the part that will be covered by the wooden handle. The knife is now ready for the handles which are to be held in place by the small steel disks.

There are several ways of fastening the disks on the handle. The most satisfactory is to file the ends of the steel shanks to three-sixteenth round and thread. Then place on the handle and disk and use a small nut to hold the handle firm. It can also be riveted but this makes necessary the heating of the tip of the handle so as to rivet more easily. Steel does not rivet well cold. After riveting you can clean it well, and give both disk and rivet a coat of tin which will even all and also take a polish. If a riveted handle is wanted, it is better to weld on iron or soft steel tips that will rivet more easily. If you cut threads on the steel handles, be sure to anneal the tips first.

TINTING FLOWERS.

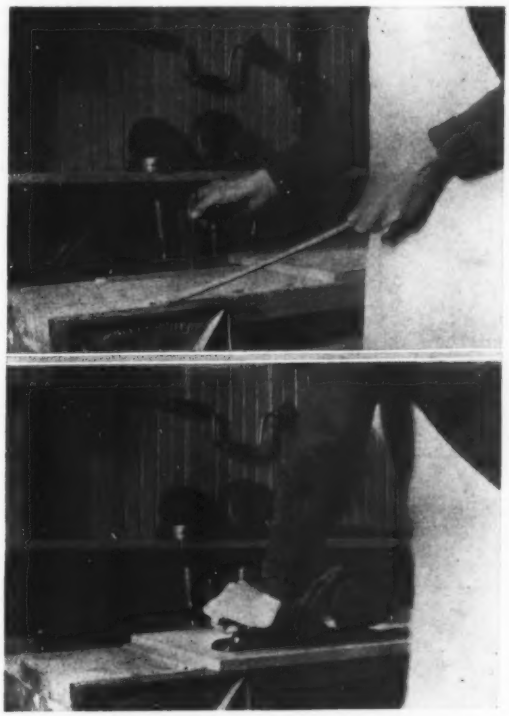
Bertha Morey, Ottumwa, Iowa.

The home milliner is often confronted with the problem of renewing faded hat trimming. Retinting flowers with a brush is uncertain and ruined flowers frequently result. To have satisfactory results the color, any cold dye, may be blown with an artist's atomizer. Mix the color in a medium tint, a second application can be made if the color is not dark enough. The leaves and berries may be dipped in the dye and dried as quickly as possible. A brush may be used to touch the centers of the flowers, the veining of the leaves and any markings on the fruit.

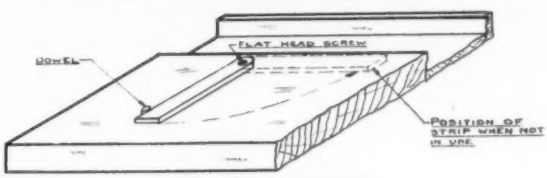
Velvet trimmings that have become rusty may be made to give longer service by blowing, with the atomizer, with gold or silver paint. The bottle must be well shaken or the metalic paint will be thrown on in large thick spots.

A BENCH STOP.

As a teacher who was a journeyman mechanic before he became an instructor, and who consequently, is prone to constantly compare average shop-school methods with those which experience taught him are "standard" in up-to-date commercial pattern and cabinet shops, may I suggest that the bench shop illustrated herewith be given a try. It long since received the approval of "graduate" mechanics.



ABOVE: THE STOP PUSHED BACK.



DETAILS OF BENCH STOP.

Suitable dimensions for the strip are about $1\frac{1}{4}'' \times \frac{1}{4}''$. The dowel—which may be any convenient diameter—should fit the hole snugly, and be somewhat longer than the thickness of the bench in order that its lower end may be easily reached with a hammer when adjustment is necessary.

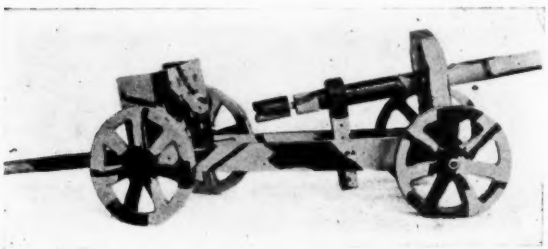
Poultry Houses. Farmers' Bulletin 113. Prepared by Alfred R. Lee, poultryman, animal husbandry division, U. S. Department of Agriculture, Washington. This bulletin, which has been written in simple style for the beginner, discusses briefly the arrangement and construction of poultry houses. It discusses especially the floor space, provision for small flock, for larger flocks, remodeling, and interior arrangement. A list of helpful bulletins is given for the benefit of members of boys' and girls' poultry clubs.

A TOY PROBLEM.

W. J. Knupp, Manual Arts Instructor, Harlan, Ia.

The accompanying picture and drawing shows in detail a very successful and interesting problem in toy-making as worked out by the author.

The problem requires a minimum amount of material and careful manipulation in assembling. The muzzle, axles, and plunger are made from a worn-out curtain roller. The wheels laid out from a templet and cut from ½" material. Templets for wheels of three, five and seven spokes were made, the seven spoke templet given to the fast and best workers.



TOY CANNON.

A rubber elastic fastened to each side at the rear end of the muzzle and around the end of the plunger places the toy in working order.

The problem is not a typical model until camouflaged with various colored paints.

TO REMOVE FADED STENCILING.

Bertha Morey, Ottumwa, Iowa.

Many pieces of handsome linen may be recovered for use if the faded stenciling is removed. Soaking over night or longer in half benzol and half wood alcohol will soften the oldest and dryest painted stencil. This mixture will not injure the material. It may be well to say that the paint does not just fall out. A good washing on the board and boiling in soap is needed to remove the design.

"WHO'S ABSENT?" A PRACTICAL SOLUTION.

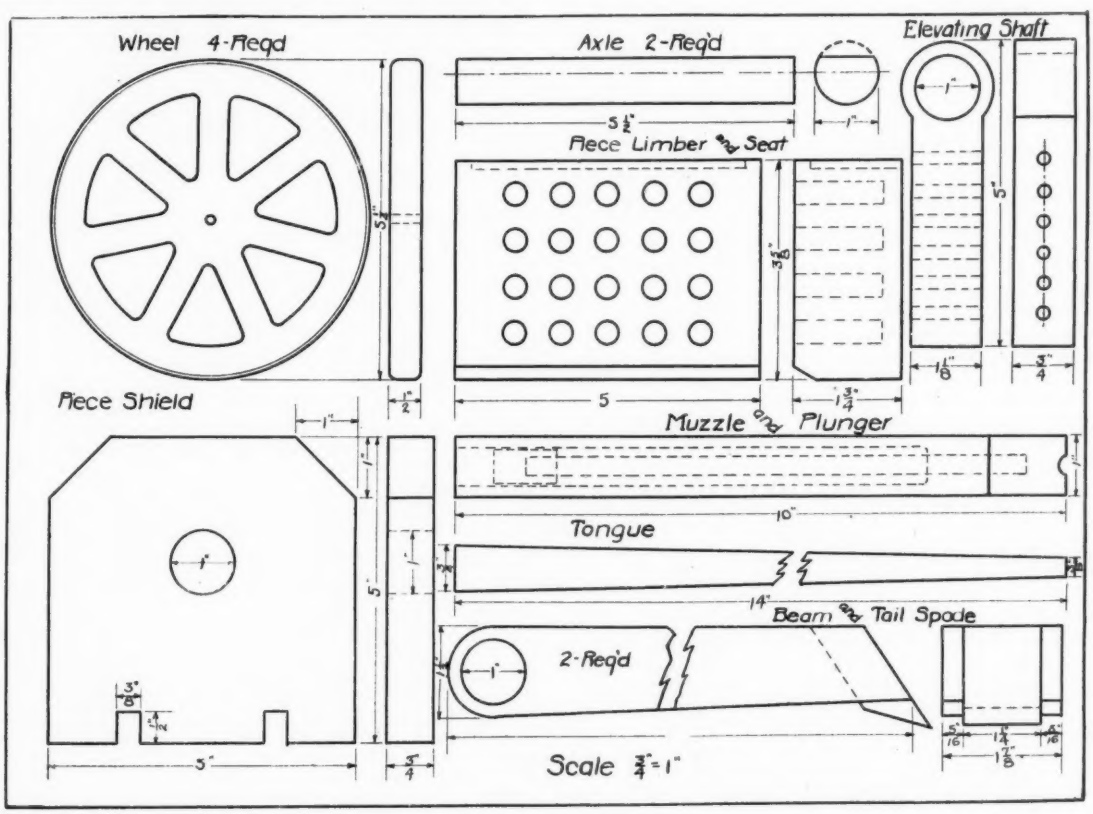
Wm. B. Miller, Holton, Kans.

Every shop instructor is crowded for time and is very liable to overlook the matter of calling the roll. Boys come into the shop and are very anxious to get to work

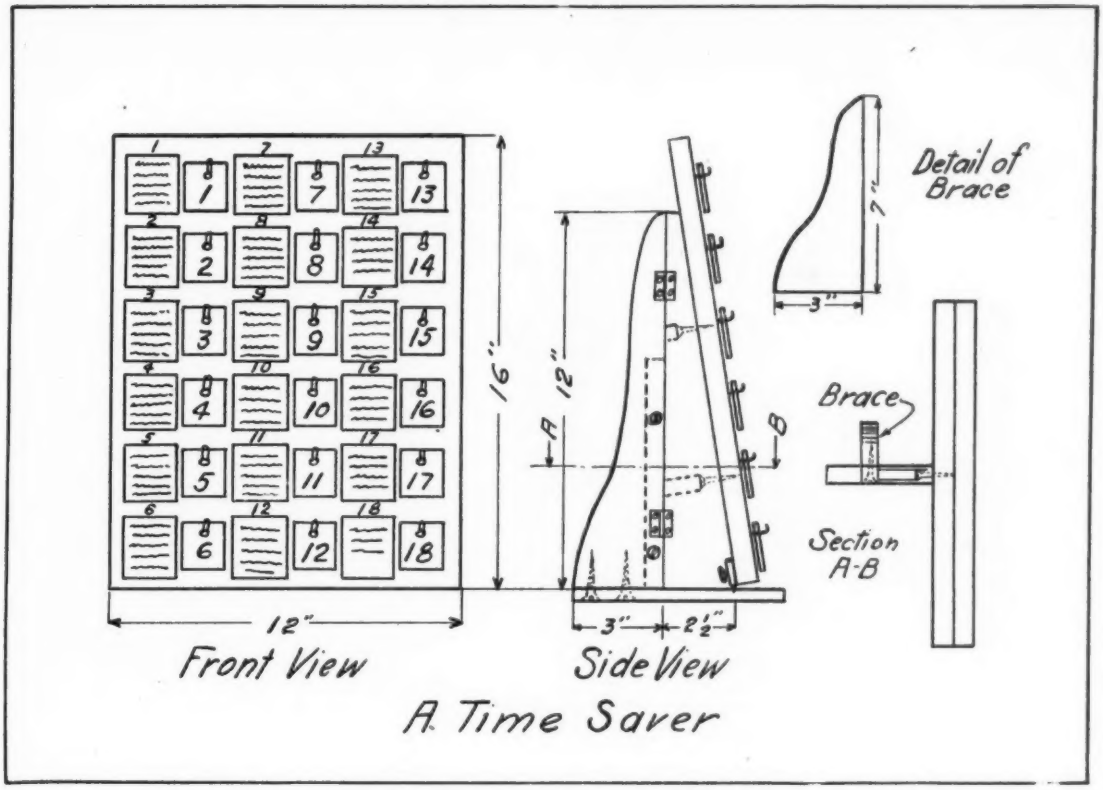
ATTENDANCE RECORDING DEVICE.

at once and do not like to sit still while the teacher calls the roll.

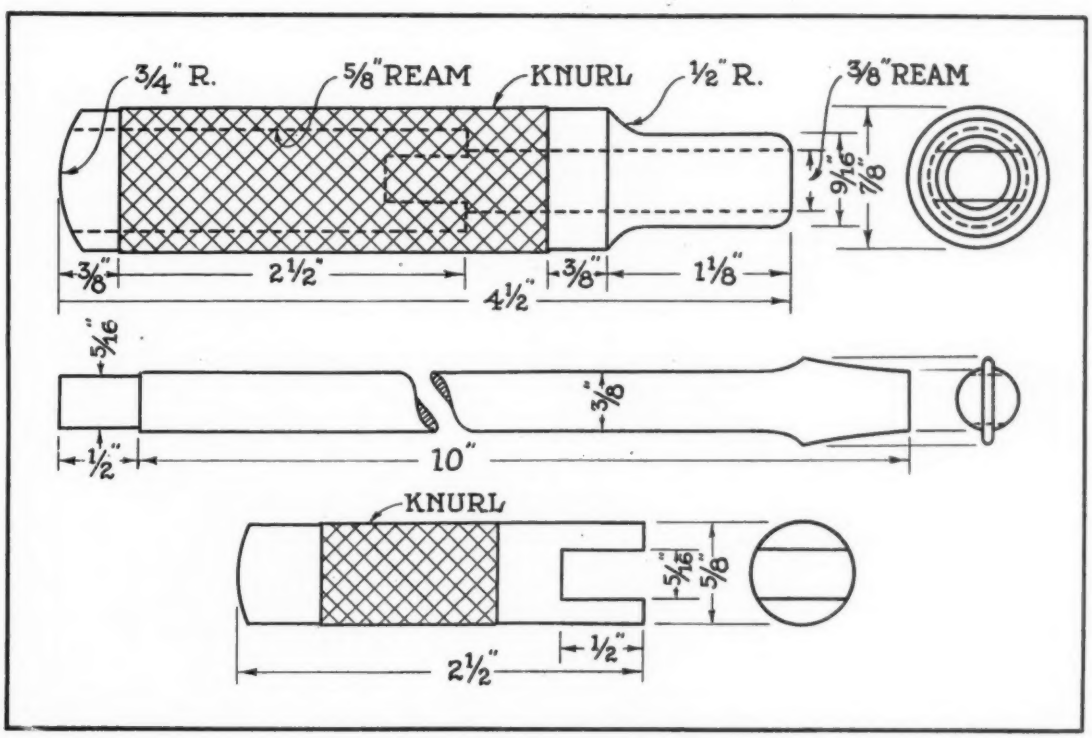
To overcome this the writer made the device described and uses it continually. It has proved to be a great labor saver and I think it is entirely practical in all shop and laboratory classes.



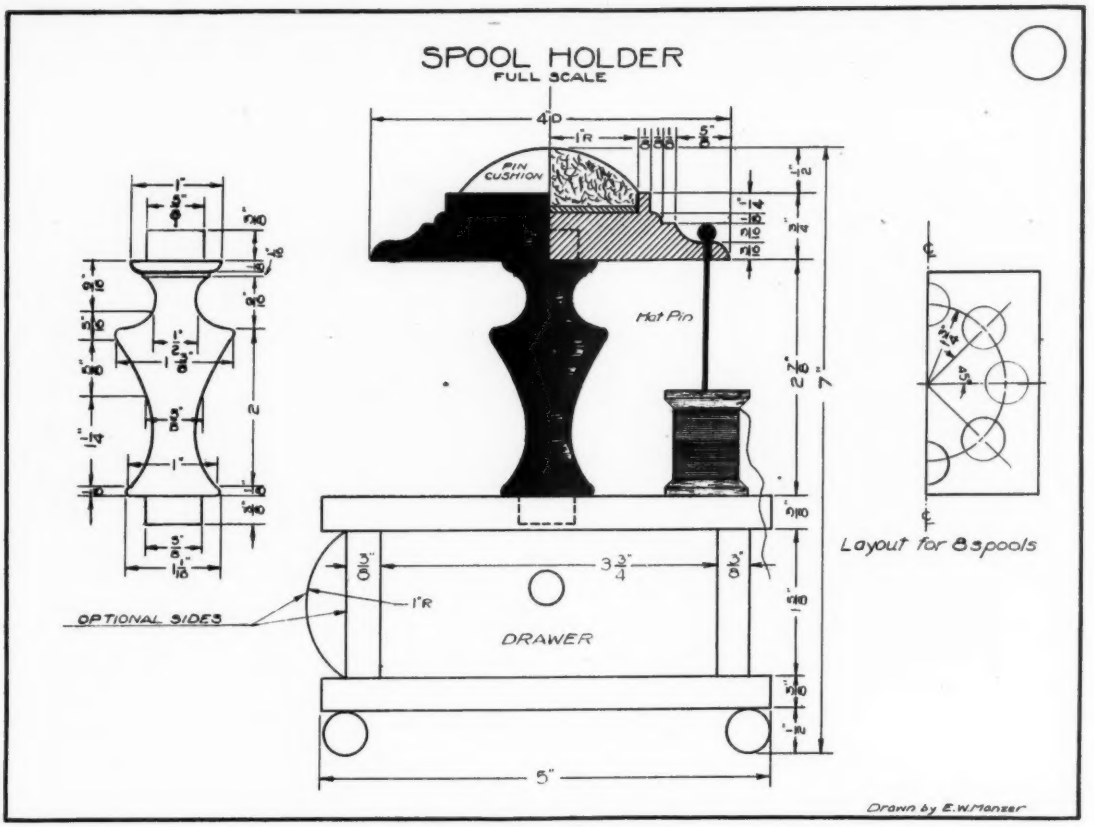
DETAILS OF TOY CANNON.



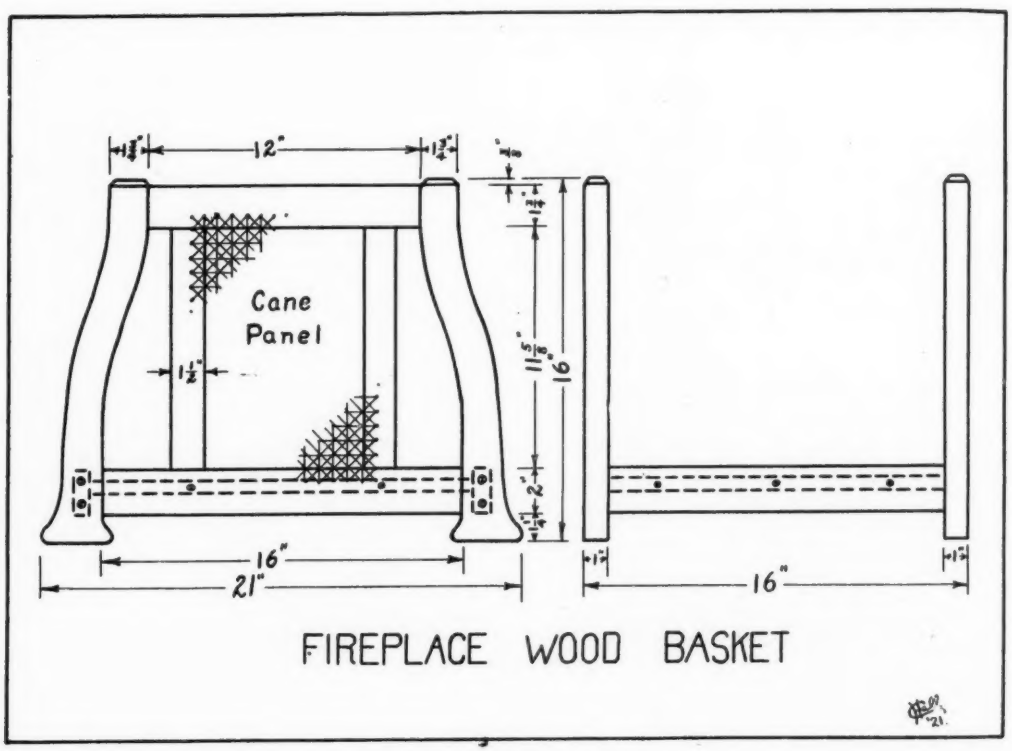
DETAILS OF ATTENDANCE RECORDING DEVICE.



DETAILS OF MACHINE SHOP PROBLEM.



DETAILS OF SEWING COMPANION.



DETAILS OF WOOD BASKET.

It consists of a board about 10″ by 14″ with screw hooks in it as shown. A small block, about 1½ by 2 with a number upon it and having a ½″ hole in it, hangs upon the hook. By the side of the hook is a label holder, numbered, and holding a card with the names of the different pupils who use the bench of this number. These are arranged by classes to facilitate use. Tool checks, keys, etc., should have this same number whenever possible.

The device is advantageous in that the teacher marks the absentees only and pays no attention whatever, as far as the records are concerned, to those present. He marks the few instead of the many. As the boy enters the room he removes the block, containing his number, from the board and retains it during the class period. As he leaves the room at the close of the period he hangs the block on the hook ready for the next class.

After all have entered the classroom, removed their blocks, and been put to work; the teacher glances at the board and makes his record, counting those absent whose blocks are still on the hooks.

To make it a little more convenient for the teacher, the board is hinged to an upright support in such a manner that it can be held toward the pupils as they enter the room. Then by releasing a cupboard catch the board may be turned toward the teacher's side of the desk. When the teacher has marked the record it is easily swung back, and automatically locks itself in position.

A MACHINE-SHOP PROBLEM.

Edward Moeser, Depew High School, Buffalo, N. Y.

This problem will be of interest to the machine-shop instructor. The handle is made of cold-rolled steel; the plug is made of cold-rolled steel and knurled for driving it in the handle. The blades are made of drill rod and with three different lengths. The body or handle can be made for any size drill rod. It is a very live problem and the boys are not satisfied with one but will want to make several.

SPOOL HOLDER.

Emerson Wm. Manzer, Madison, Wis.

This useful article requires face and center turning, drawer construction, accurate planing, review of squaring up stock, finishing stock and serves as an excellent problem following wood turning and preceding cabinet making.

Students are demanding useful problems and this meets that important requirement.

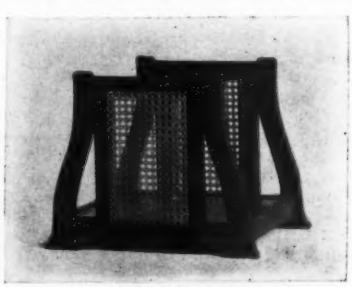
The sides and draw front may be covered with moulding as is shown in the drawing.

WOOD BASKET.

C. H. Hall, DeKalb, Ill.

This basket was designed to hold kindling and other wood near the fireplace. A handle could be added if desired and it could then be used for carrying wood from the basement, altho the design is a little large and heavy for that purpose.

The basket is constructed in such a way that it may be used as either an eighth grade or high school problem. The sides are fastened together with ⅜″ dowels. After



WOOD BASKET.

the caning is finished, the sides are fastened to the bottom board and end rails with round head screws.

Hickory splints or thin board panels could be substituted for the cane if desired.

A NEW VOCATIONAL HIGH SCHOOL.

The new Vocational High School at Okmulgee, Oklahoma, which has been under construction for the past year, is now ready for occupancy. The building is declared by experts to be one of the best plants in the entire southwest for instruction in vocational courses.

The building is a three-story brick structure. On the first floor are the automobile, carpentry and electrical shops. The automobile shops are adequately equipped with the necessary machinery to be used in general automobile repair work. Storage battery, tire repair, vulcanizing and acetylene welding rooms are also provided. The carpentry shops are so arranged that small portable buildings may be moved in and out of the shops and the students are afforded ample opportunity for practical work in house building and interior finishing work. A partially completed miniature house in the electrical shop affords opportunity for practice work in the wiring of houses.

The second floor of the building is occupied by the home economics department which is equipped with those things needed for adequate instruction in the various classes. Two rooms on this floor are given over to the medical clinic and a part of the floor is occupied by a girls' gymnasium.

On the third floor there are science laboratories, classrooms and the commercial department, which is equipped with a miniature bank with vault and three tellers' windows.

A winding stairway leads from the floor to the roof, on which is located a roof-garden where growing beds and greenhouse equipment have been installed. Here instruction in floriculture and kindred subjects will be given. There are office rooms, store rooms and rest rooms which serve each department and add to the convenience and pleasure of instructors and pupils alike.

The Superintendent of Schools is Mr. H. B. Bruner who, after an extended visit with experts in vocational education in several of the states, has obtained the best instructors available. A consistent effort is made to carry out in school practice the things which have been and are taught in leading pedagogical schools.

It is contemplated that courses taught in the new school will include automobile mechanics, electric motor repairing, electric wiring, telegraphy, printing, carpentry, interior decoration, arts and crafts, sheet metal work, oil analysis, salesmanship, banking, business law, bookkeeping, stenography, typewriting, cooking, millinery, dressmaking, nursing, floriculture, expression, music, and physical education.

TRADE AND INDUSTRIAL EDUCATION IN OKLAHOMA.

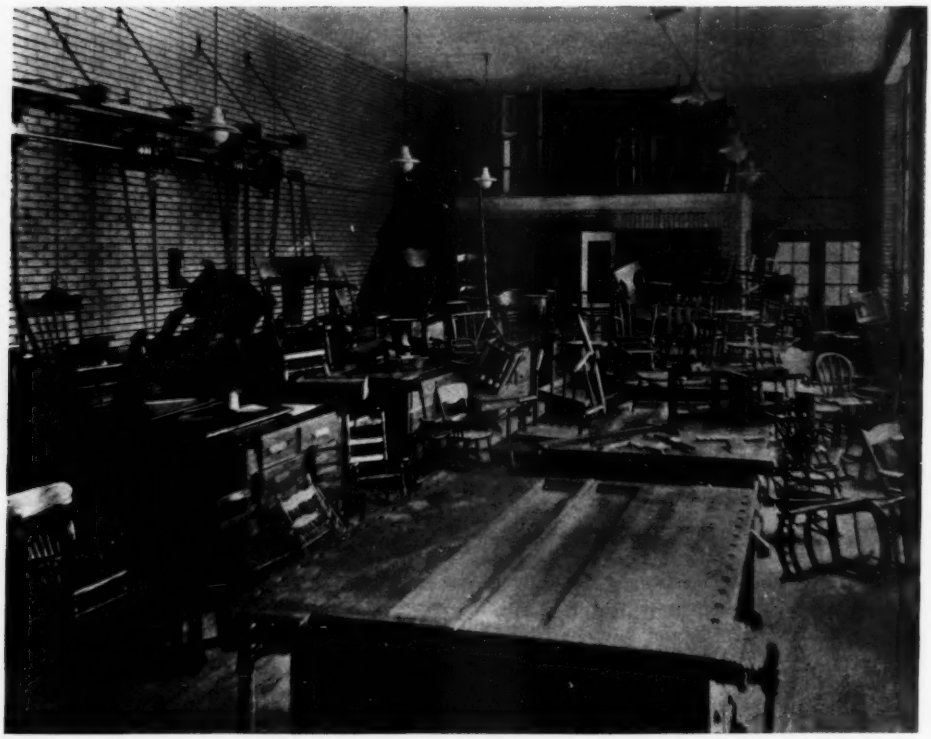
Henry F. Holtzclaw, Supervisor, Trade and Industrial Education.

The provisions of the Smith-Hughes Act as passed by the 64th Congress were accepted by the sixth legislative session of the state of Oklahoma and approved by the Governor on the 24th day of March, 1917, in House Bill 213. The state treasurer was designated custodian of all funds allotted and a state board of vocational education was created. The board consisted of the chairman of the board of education, the president of the board of agriculture, the president of the University of Oklahoma, the president of the A. and M. College and a member, designated as secretary, to be appointed by the governor.

Since the appointment of the first secretary, vocational education as carried on by the state of Oklahoma has met with encouraging success. At the present time Oklahoma ranks well with other states of its size and age in the development of the program of vocational education and this is particularly true in the field of trade and industrial education.

There are eight cities in the state in which there are given trade and industrial courses meeting the requirements of the state and federal plans and are, therefore, subject to reimbursement from state and federal funds.

Under the state plan the number of day-unit trade



FURNITURE FROM HOMES TO BE REPAIRED BY THE BOYS OF SOUTH HIGH SCHOOL, LIMA, O.
Harvey C. Robinson, Instructor.

schools has increased to five and day-unit trade classes to ten. Instruction is given in carpentry, printing, automobile mechanics, machine shop practice and shoe repairing. Instruction in related subjects includes mechanical, architectural and typographical drafting, applied mathematics, electric wiring and repair, applied science, press work and book-binding.

Two evening schools have been approved and the plans for a third school have been formulated. Courses given in the evening schools are, automobile mechanics, drafting, carpentry, practice shorthand and typewriting, garment making, millinery, home nursing, dietetics, business English, business arithmetic, journalism, salesmanship, business law, practice telegraphy and comptometry.

Part-time and general continuation schools are in operation at Tulsa and Oklahoma City and at the Sand Springs Colored school. Five teachers are employed. A director for evening and part-time work has been appointed by the superintendent of schools of Okmulgee and we expect another creditable part-time school to be added to our program.

Teacher training is carried on by the board in a very limited way. A course in foreman training in which twenty head foremen of the Cosden Oil and Refining Company of Tulsa were enrolled, has recently been completed. The conference lasted for two weeks, was promoted by the director and by the supervisor of trade and industrial education and was conducted by Frank Cushman, special agent for industrial education for the Federal Board for Vocational Education.

Each member of the staff of the Board of Vocational Education is devoting nine weeks of time to a course in "Organization and Administration of Vocational Education" to be given in the summer schools of each of the six State Normal Colleges, the University of Oklahoma, the A. and M. College and Phillips University. Credit is given to those who satisfactorily complete the course which is a study of the development of modern industrial institutions and their educational significance, general provisions of the Smith-Hughes law, state boards, and state plans, types of vocational schools and special provisions for each type. Attention will be given to administration and supervision of teacher training, industrial surveys, scientific management and training for industrial occupations. In the University of Oklahoma the course is known as Education 180 and three hours' credit is given for successful completion.

New Books and Pamphlets.

Automotive Ignition Systems.

By E. L. Consoliver and G. I. Mitchell. Cloth, octavo, 269 pages. McGraw-Hill Book Co., Inc., New York.

This practical book has been developed from the author's correspondence and lecture courses for electricians and automobile mechanics. It covers the principles of electricity and magnetism and describes the construction and operation of the principal types of ignition batteries, jump-spark ignition systems, battery ignition, low-tension magnetos and inductor types. The two final chapters take up the special details of the care and repair of apparatus and "trouble shooting." The text is of the popular-technical type and emphasizes the simple facts of the best type of devices now in use rather than the engineering principles upon which they are based. The illustrations are clear and fulsome. The book measures up to the high standard set by the University of Wisconsin Engineering Education Series.

Permodello Modelling.

By Bonnie E. Snow and Hugo B. Froehlich. 46 pages, illustrated. The Prang Co., Chicago, New York.

This book suggests an interesting form of applied art work for high schools. Permodello is a prepared modelling clay containing a binder which gives it unusual modelling qualities and dries without shrinking or cracking to a stone-like hardness. The book describes very accurately the best methods of working the material and suggests a wide variety of useful and ornamental articles which may be constructed. The chief value of the book is in the artistic design and color combination which the senior author has worked out.

Needlecraft for Older Girls.

By Margaret Swanson. Cloth, crown octavo, 111 pages, illustrated. Longmans, Green & Co., New York.

This book offers suggestions for a course in needle-

work for girls between the ages of 14 and 18. It emphasizes originality in design and suggests in the progressive problems, definite principles in design which are to be applied. In the selection of problems and the progressive difficulty of the design, choice of colors and materials, the natural instincts and interests of the girl are definitely used to hold the attention and fix the objective. Thus the earlier lessons recognize the desire of possession and the later work reflects the approach to wifehood and its natural responsibilities.

While much of the material in the book may not meet the approbation of American teachers and pupils who slavishly observe "style" in the needlework courses of our high schools, the underlying idea of the book cannot fail to command attention and respect. The principles laid down are fundamental to any course in needlework that would be more than merely utilitarian.

Carpentry for Beginners.

By William Fairham. Cloth, 12mo., 217 pages. J. B. Lippincott Co., Philadelphia, Pa.

This book is intended for the home carpenter or amateur woodworker and presents fundamental information on tools and woodworking processes. A series of projects, including simple cabinet work and home and garden carpentry is developed simultaneously with the formal descriptions of processes. There is considerable material of the familiar coat hanger and nail box type, but quite a few of the problems are different and quite interesting.

It is to be regretted that the publishers have not taken better account of American usage, but have left unedited all of the author's British trade language and suggestions for the use of more or less obsolete tools.

"Needs and Opportunities in Industrial Arts" is the title of an interesting little pamphlet just issued by the Philadelphia School of Design. The pamphlet is a reproduction of an address delivered by Dr. James Parton Haney at the School of Design, and discusses in particular ideas and ideals of art in years past, post-war conditions, art for use, training the many and the few, the art schools needed, opportunities and needs, lessons of the war period.

Suggestions on the Manufacture, Sale, Repair of Rubber. Home Service Circular 6-D-1, Junior Achievement Bureau, Eastern States League, Springfield, Mass.

TWO IMPORTANT CHANGES.

MR. S. J. VAUGHN,
President-Elect Hardin College,
Mexico, Mo.

ROYAL B. FARNUM,
Principal-Elect, Massachusetts
Normal Art School,
Boston, Mass.

O. H. Benson, Director. The project begins with the repair and salvaging of rubber articles and includes a first-hand study of all that the community has in the way of making, selling and repairing of rubber goods. Demonstrations are suggested along the line of making, testing, selling, using, care or repair of rubber articles.

Proper Treatment for Floors, Woodwork and Furniture. 25 cents. S. C. Johnson & Son, Racine, Wis. A booklet prepared especially for architects, contractors, painters, interior decorators and people building new homes. Gives detailed information on the proper way to finish new and refinish old woodwork, floors and furniture.

Home Laundering. By Lydia R. Balderston. Farmers' Bulletin 1099, U. S. Department of Agriculture. The pamphlet tells how the drudgery of laundry work may be overcome by using good supplies, proper equipment and following the best modern methods. It takes up the arrangement and equipment of the laundry room, methods of laundering, and special cleaning and pressing.

FURNITURE AFTER IT WAS REPAIRED BY THE BOYS OF SOUTH HIGH SCHOOL, LIMA, O.
Harvey C. Robinson, Instructor.

NOW, ARE THERE ANY QUESTIONS?

This department is intended for subscribers who have problems which trouble them. The editors will reply to questions, which they feel they can answer, and to other questions they will obtain replies from competent authorities. Letters must invariably be signed with full name of inquirer. All questions are numbered in the order of their receipt. If an answer is desired by mail, a stamped envelope should be enclosed. The privilege of printing any reply is reserved. Address, Industrial-Arts Magazine, Milwaukee, Wis.

Boat Building.

199. Q:—I am desirous of finding plans for a canoe. —F. R. W.

A:—"Optic's Boat Builders' Series," $1.25, Lothrop, Lee & Shepard, Boston; "Beard's Boat Building," $1, Chas. Scribner's Sons, New York; "Moore's Manual Training Toys for the Boy's Workshop," $1, Manual Arts Press, Peoria, Ill.; "Hasluck's Building Model Boats," $0.50, Funk & Wagnalls Co., New York; "Neison's Practical Boat Building for Amateurs," $1, F. J. Drake, Chicago; "Yates's Boy's Book of Model Boats," $2, Century Co., New York; "Hall's How to Build a Canvas Canoe," Lothrop, Lee & Shepard; "Stephen's Canoe and Boat Building," $2, Forest & Stream Publishing Co., New York; "Vaux's Canoe Building," $1, Forest & Stream Co; "Stephens' Boat Building Plates," Forest & Stream Co.; "Hall's The Boy Craftsman," Lothrop, Lee & Shepard; "Miller's Canoeing and Sailing," Geo. H. Doran Co., New York.

Refinishing a Beech Floor.

200. Q:—I would like to consult you in regard to some new beech floors which we have. We were anxious to have them a walnut brown and were given Bismark brown to stain them. This was done with the result that they are red. We were told that there was probably tannin in the beech, which caused the change in color. Can you tell us what to do in order to get a rather light shade of walnut brown? Three floors have been stained with the Bismark brown, two of them have been varnished with one coat of valspar.—E. R.

A:—Where beech floors have been stained with Bismark brown and afterwards varnished, the only recourse which remains is to entirely remove the finish and color by mechanical sanding machine or handscraping and sandpapering. It is the absence of tannic acid, rather than its presence, which is responsible for the red tone of the Bismark brown. This color is used principally in the textile industry where in an acid bath it develops a rich, full bodied brown color. As usually applied to wood, however, it furnishes a rather broad range of mahogany and red.

It is possible to mix water soluble Bismark brown and water soluble nigrosine to produce any shade of brown which is desired and if a warmer, brighter tone is needed, a little water soluble yellow aniline will accomplish the result. It is best to entirely resurface the floors to new wood, apply the stain in full body, endeavoring to stain all floors at once wherever practical, thereby ensuring an evenness of tone thruout.

After drying 24 hours the whole floor should be gone over with a brown silex filler made up to a warm or red chocolate brown which can be secured by the use of burnt sienna or better still rose lake and Van Dyke brown. With this thin filler the inherent unevenness in hardness and softness of beech can be overcome and the small cracks in the joints will be filled up so that the whole varnish floor will present a much better appearance than can be otherwise secured.

Avoid the use of shellac under varnish for floor work. It has been our practical experience that two coats of Pratt & Lambert's No. 61 Floor Varnish will produce a better job than the varnishes which you have been using. —Ralph G. Waring.

Finishing Red Gum.

205. Q:—I would like to know how to finish quarter sawed red gum (figured) so that it will show the peculiar grain it has in the natural. I tried it as mahogany but all of the graining was obscured.—M. B. M.

A:—Carefully sand the figured gum in order to bring it up to perfect mechanical condition. Dust off and apply a coat of material made as follows:

Turpentine 1 quart.
Linseed oil ½ cup.
Japan drier 2 tablespoons.

This should be brushed on carefully and evenly and allowed to dry at least one week in a warm room, free from dust. Give a sizing coat of white shellac from stock reduced one-half with alcohol, dry five hours and sand glass smooth.

Dust off and apply a well brushed out coat of Pratt & Lambert No. 38 varnish which when hard and dry should be sanded smooth and free from defects. A second coat of varnish should then be brushed in full body; when hard and dry rub out with water, felt pad and FF pumice stone to a medium gloss. Clean up with a good oil polish ready for use. The object of this treatment is to emphasize the natural cream and brown streaks and at the same time soften the tone of these portions. The finish should be kept as thin as possible in order that its transparency may seem to be part of the wood itself rather than the result of many coats of heavy bodied varnish. It is for this reason that No. 38 has been specified instead of No. 61 varnish.—Ralph G. Waring.

Finish on Trunk.

213. Q:—(1) A coat of "silicate soda" was put on a trunk, varnish over that and in a week the trunk looked as if it had been immersed in a salty brine. The trunk was rubbed down, a coat of paint put on and then varnish was added, but the varnish would not finish smooth. It looked as if there was oil in the varnish. Now what causes the varnish to do that and is there a way to put a good finish on the trunk?

Q:—(2) Could you tell me where I could get books of instruction on caning?—F. G. B.

A:—How in the name of all that is reasonable anyone can use silicate of soda as a sizing material is beyond comprehension. There are a few instances where it is used industrially, as in the polishing of wood casters and in fireproofing of certain tool handles. In these instances a good polish is secured only under special conditions. It is impossible to produce a good finish with silicate of soda under paint or varnish. Water glass, as it is commonly spoken of, is very unstable at all times especially after exposure to the atmosphere which causes it rapidly to go to pieces and to assume a chalky condition.

The varnish manufacturer should not be given the blame for a faulty finish when the foundation of a job is entirely faulty. Varnish is made up of oil and gums and it must not be assumed that it is inferior or defective when a material like water glass is used.

The only thing that can be done with this trunk is to use a varnish remover and hot gold dust suds to entirely remove the mess that is now on the trunk. It should be allowed to dry two or three days and then should be thoroughly washed with vinegar to neutralize the free alkali of the soda solution. The trunk should be allowed to dry 24 hours or longer after the application of the vinegar and then should be coated with a well brushed finish of a manufactured floor paint tinted to cover the stains and spots. After the color coat has dried from five to seven days it should be given a medium coat of a hard varnish like Pratt & Lambert's No. 61.—Ralph G. Waring.

A:—(2) The following are good books of instruction on caning: "Seat Weaving," by L. Day Perry, Manual Arts Press, Peoria, Ill.; "Chair Seating with Cane and Raffia," by John H. Jinks, J. L. Hammett Co., Cambridge, Mass.; "Problems in Woodwork," by Edward F. Worst, Bruce Publishing Co., Milwaukee, Wis.

Oil Engines.

214 Q:—I am desirous of securing a book which explains the construction and operation of some of the modern American-made stationary kerosene engines.—A. H. L.

A:—"Morrison's Oil Engines," $5, McGraw-Hill Book Co., New York; "Collins' Gas, Gasoline and Oil Engines," $1.25, D. Appleton & Co., New York, Chicago; "Hiscox' Gas, Gasoline and Oil Engines," $2.50, N. W. Henley Co., New York; "Wimperis' Internal Combustion Engine," $3, D. Van Nostrand Co., New York.

Bulletin of Evening Courses, Toledo, O. The pamphlet gives the requirements for enrollment, and offers outlines of courses in trade and vocational subjects for men and women.

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I-AM 7-21

SCHOOL CRAFTS CLUB MEETING.

The annual meeting of the School Crafts Club of New York City was held on May 21st, at the Hoboken Chamber of Commerce, in the Hoboken Land and Improvement Company Building. At the meeting, Mr. John W. Lieb, of the New York Edison Company, gave an illustrated lecture on "The Industrial Experiments of Leonardo Da Vinci." The get-together meeting took the form of a smoker, with informal features added to the program.

OSWEGO CONFERENCE.

A Special Conference of industrial arts teachers, industrial teachers in part-time schools, industrial teachers in general industrial, unit trade, and evening vocational schools was called at the State Normal School, Oswego, N. Y., by Mr. L. A. Wilson, the State Director, on May 13, 1921. Teachers were present from central and northern New York. The following program was presented:

"Organization and Administration of Junior High School Industrial Arts" Verne A. Bird, Director of Industrial Education, Utica, N. Y.; "Educational Values and Industrial Arts," Leon L. Winslow, State Education Department, Albany, N. Y.; "Critical Evaluation of the Work of Industrial Teachers in the State," as to Factors of Coordination, Eugene D. Fink, Teaching, Robert H. Rodgers, Preparation for Service, Donald M. Kidd; "New Phases of New York State Program of Vocational Education," Lewis A. Wilson, Vocational and Extension Division, State Education Department, Albany, N. Y.; "Adult Foreigner and Vocational Education," W. C. Smith, State Education Department, Albany, N. Y.; "General Industrial School, Robert H. Rodgers; "The 1921-22 Program of Part-time Education," Oakley Furney, State Education Department, Albany, N. Y.

NEWS AND NOTES.

A Vocational School. The Cumberland Sanitarium, at Somerset, Ky., operated for disabled service men, has recently been turned into a vocational training school for soldiers. In addition to vocational training, a business course will be offered.

Demonstrate Value of School. An exhibit of the work of the boys at the Newark (N. J.) Vocational School was recently held to acquaint citizens with the value of a vocational school. In addition to finished products on display, there were actual class demonstrations of work carried on by the boys.

Make Play Furniture. The boys of the East High School, at Cleveland, O., have made considerable doll furniture for use in the kindergarten rooms. The furniture was all made by the manual training classes in the junior and senior high schools.

Conference of Continuation Schools. A conference of continuation schools was held at the Girls' Vocational School, at Newark, N. J., with educators in attendance from various sections of the state. Mr. W. A. O'Leary, Director of Vocational Work, presided.

Among the speakers at the conference were Miss Elizabeth Whitman, Hackensack; Mr. Daniel Sweeney, Bayonne; Mr. J. M. Herd, New Brunswick; Mr. Ralph Parker, Camden; Mr. Thomas F. McHugh, Newark.

Miss Edith Jones, of the Girls' Continuation School, Newark, N. J., told of the study being given the industries of the city employing girls. About 25 girls a day are interviewed about employment.

Abandon Vocational High. The Vocational High School, at Minneapolis, Minn., is to be abandoned with the completion of the new high schools in course of construction. A vocational high school for boys and girls will be established at the East High School.

Organize Vocational Teachers. An organization of vocational teachers of Pueblo, Colo., has been formed. The organization includes night school teachers, vocational high school teachers, and other instructors in vocational work. E. W. Frick has been made president and Miss Luella Hildinger secretary.

Sale of Handiwork. A sale and exhibit of handwork of shut-ins was held May 14th, at Chicago, under the auspices of the Vocational Society for Shut-ins. Sport hats, baskets, trays, fly swatters, porch linens, lanterns and other articles were sold at bargain prices.

Schools to be Used for Disabled Soldiers. The board of education of Los Angeles, Calif., has placed all high schools of the city at the disposal of the federal board for

(Continued on Page XXV)

COLUMBIAN

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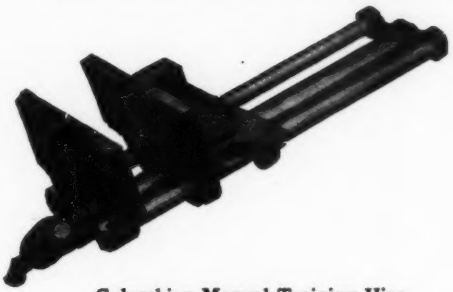

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CLEVELAND

(Continued from Page XXII)

the training of service veterans. The federal board has experienced some trouble in placing a large number of students in institutions where certain kinds of work are offered.

A Vocational School. The board of industrial education is studying plans for a central vocational school at Fond du Lac, Wis., to be erected at a cost of $60,000. The suggestion has been made that the industrial-vocational school be combined with the vocational end of the high school to eliminate duplication of equipment and expense.

A Trade School. A trade school for disabled soldiers will be opened at the state university of Nebraska on September first. The subjects taught will include carpentry, pattern making, blacksmithing, brick laying, plumbing and machine operating.

Girls' Handiwork on Exhibit. An exhibit of the work done at the Manhattan Trade School for Girls, in New York City, was recently held at the school building. Diplomas and certificates were received from the following classes:

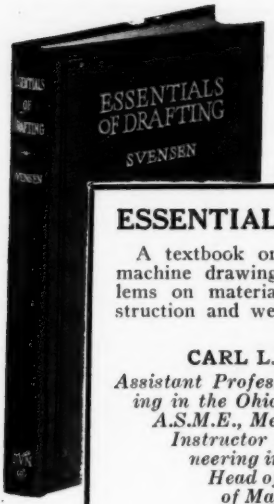
Trade dressmaking (elementary), trade dressmaking (advanced), trade millinery, machine operating for waists and dresses, machine operating for straw hat making, drafting (for dressmakers), waists and skirt draping (costume designing), lamp shade making, novelty glue work (cretonne boxes, etc.), trade design (for costume sketching, embroidery), manicuring and shampooing, civics and labor laws, gymnastics and hygiene, and methods in trade teaching.

Progress in Vocational Agriculture. The high school department of vocational agriculture at Cottage Grove, Ore., organized under the Smith-Hughes law, has been established for nine months, and instruction has been given for six months. The work started last September with 31 students enrolled in two sections of the animal husbandry class. Of the 31 students, fourteen were country boys and six other boys came from homes where chickens are kept as a business undertaking. Two of the girls were country girls and one of the town girls was a "natural digger" and distinctly in place for an agriculture class. Of the original 31 enrolled, 24 remained and 23 are still in the agriculture work. The work as outlined consisted of seven main divisions, i. e., hogs, beef cattle, sheep, horses, dairy cattle, poultry, diseases and sanitation. The chicken industry is better developed than most other lines of farming and ten of the 23 projects now under way are laying hens. These are good-sized projects ranging from sixteen to 149 hens, and some have shown a substantial profit.

Chassis for Instruction Purposes. The Vocational Department of the South Bend (Ind.) Vocational School has received a gift of a Studebaker light six chassis to be used for instruction purposes in the automobile shop. The chassis is mounted so that the engine can be operated while making a study of the various mechanisms of the car. In this way it is readily made the basis for study of general automobile construction and maintenance.

Establish State Trade School. The State Board of Connecticut has established a trade school at Kent, with an enrollment comprising two full-time boys, ten part-time boys from the high school, twelve part-time boys from the grades, and eight in the evening class. The school has been a success thus far, and during the past summer and fall, the director turned away more work than he accepted. The plans for the future include instruction in drafting, forging, wood finishing, concrete construction, and a building of sufficient size to accommodate the increasing activities of the school.

Domestic Science Department Self-Supporting. For several weeks the domestic science department of the Sullivan, Ind., High School has been self-supporting. This has been accomplished through the efforts of Miss Aileen Oliver, Domestic Science Instructor, and her class in cooking. Lunches are served at the lowest price possible on each school day except Mondays. These lunches are so popular that not only the students but the public are asking permission to patronize them. From the sale of candy made by the domestic science department and served at the various school functions, enough money was made to purchase material for a dining table which was built by the boys of the manual training department. Dishes, cook-



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ing utensils, an ice chest, etc., were also purchased. During the summer vacation a room adjoining the kitchen will be put in order, to be used for serving lunches when the class commences work next fall.

Productive Work in Cabinet Making. The industrial department at Allentown, Pa., has begun the manufacture of domestic science tables, manual training benches, desks, sewing tables, and cabinets for the use of the schools. The work has made a net saving of about $6,000 to the district and the students have had the benefit of instruction in commercial methods of manufacture.

Practice Teaching in Home Economics. The Pennsylvania State College, at State College, for the second year, put in operation a plan for providing experience for students in home economics teacher training courses. In cooperation with eight public schools and the State Education Department, the College placed eight of the seniors in the schools for six weeks. While in these schools they were given an opportunity to assist the regular teachers and to assume full responsibility for teaching. The reports on the work indicate that the plan has proved altogether successful.

To Introduce Day Industrial Courses. A survey has recently been made of the city of Harrisburg, Pa., with a view of developing trade courses. An experimental class in pattern making was conducted with such success that it will be made one of the vocational courses. Plans have also been made for a class in practical electricity.

The rebuilding plans provide for the remodeling of the present technical high school into a Junior High School and the erection of new shops to occupy the entire block.

Teachers' Improvement. By common agreement, the teachers of household arts, industrial, and unit trade courses in the Schwab Industrial School, at Homestead, Pa., have been holding joint monthly meetings. At each of these meetings, two teachers were selected to lead a discussion based upon the work they were doing, its aims and relations to other departments. The plan has contributed much to the cooperation and understanding among the teachers.

Industrial Work Established. The high school shops, at Williamsport, Pa., have been equipped for industrial education. An evening class in furniture design and rod making is one of the special features of industrial education in the city.

Industrial Education Introduced. Coatsville, Pa., has embarked upon a progressive plan for vocational education. The past year has witnessed the development of a number of evening classes and plans are under consideration for establishing day courses for the next school year. Mr. M. M. Walter is the director in charge of the work, under Supt. H. R. Vanderslice.

Practical Training for Boys. Mr. H. L. Cliver, Supervisor of Industrial Art for Boys, Summit, N. J., during the past year, directed the work in a very practical way. Mr. Cliver organized the classes into groups which attempted many jobs of construction and repair. The boys met with real situations and learned to do by doing. Groups of boys worked on such problems as wrecking and building a grandstand for an athletic field, building bleachers, building and repairing lockers, refinishing furniture, refinishing science equipment, building bank windows for classwork, etc. The department also carried out a systematic and progressive course of study with each class cooperating effectively with other departments and producing many articles for plays, exhibits and sales.

Correlation of Art and Manual Arts. Under the direction of Miss Florence S. Robbins, an effort was made at Summit, N. J., to correlate the work in art and manual arts very closely with the academic subject matter of the pupils, to help clinch facts and to develop imagination, hand power, artistic sense and appreciation in line, color and arrangement. The general curriculum of the grades gave considerable emphasis to the study of Colonial life in America. A complete Colonial room was constructed by the art and sewing departments and several problems of this nature were successfully carried out.

The high school classes devoted considerable time to objects for a Junior Red Cross Sale. They painted a variety of articles with "enamelac," including coathangers, tin and wooden boxes, jars, bottles, luncheon sets and toys made by the manual arts department. A collection of

(Continued on Page XXIX)

(Concluded from Page XXVI)

wooden dolls gave a good idea of the correlation between the several departments, as they were made in the shop, painted in the studio, and finally clothed in the sewing room.

An intensive study of color and color harmonies has been made through the use of tempera paints as a medium. This was followed with freehand designing and later by decorative drawings from natural objects. Designs were developed from the drawings and applied to Batik dyeing of ties, collars, table covers, smocks, etc.

Industrial Work Emphasized. The Stephens Industrial School, at Summit, N. J., during the past year, has devoted additional time to industrial and manual work. Through the receipts from chair-caning, basketry, shopwork and articles made in class and sold to the Red Cross, the classes have taken in $110. With the fund have been purchased many cooking utensils for the kitchen, dishes and silver for the dining room, garden and flower seeds. Out of this, the boys were also paid $0.35 for each chair caned. Eight chairs for the schools and thirty for the citizens were caned, so that $16 was raised.

At the beginning of next year, it is planned to redecorate a bedroom on the third floor of the housekeeping apartment and to make rugs for the floor. A bed has already been enameled for the purpose.

The Vocational Guidance Association of New York City, met at the Russell Sage Foundation Auditorium, on May 19th, for a general conference. The subject of the conference was "The Need for Vocational Guidance in the Schools."

The following speakers discussed the subject:

Dr. William L. Ettinger, superintendent of schools, "The Need for Vocational Guidance in Our Schools; What the Schools Have Already Accomplishel and What Will Be Done."

Morris E. Siegel, director of continuation and evening schools, "Vocational Guidance in the Continuation School; What Has Been Achieved and What Plans for Extension of Vocational Guidance in the Continuation Schools Are Being Considered."

Dr. Michael H. Lucey, principal Julia Richman High School, "Vocational Guidance in the High School; Present Methods and Proposed Plans."

Louis Marks, principal Junior High School, 64 Manhattan, "Vocational Guidance in Junior High and Elementary Schools; What Has Been Done and What Should Be Done."

A. E. Kidd, employment manager, Western Electric Company, "The Need for Vocational Guidance in Industry."

The discussion was led by Mrs. Alice K. Pollitzer, Director of the Vocational Guidance and Junior Employment Service.

Houses Built by Pupils. The vocational department of the Cincinnati public schools held an interesting exhibit during the week of May 21st to 27th, in connection with the "Own your Home" Exposition. The school exhibit which was intended to show the results of vocational training in the intermediate grades, consisted of three miniature residences, built by the pupils of three of the schools, and embracing every feature that goes into the design of homes. The materials of construction were contributed by local firms and illustrated the variety of building supplies which have their origin in the city of Cincinnati. The exhibit was enhanced by garden effects surrounding it and by artistic illumination of the buildings.

State to Employ Expert. An educational expert is to be employed to direct the survey of Indiana authorized by the last legislature. Mr. Charles M. Curry of the Indiana Normal School, Terre Haute, has been chosen as chairman of the survey commission which is to make the investigation of the educational situation in the state.

Will Sell Gauges and Try-squares. The art and handwork department of the public schools of Springfield, Mass., has announced that it has in its possession large quantities of marking gauges and small steel try-squares, which it will be glad to dispose of. The instruments are all in good condition and will be sold at reasonable prices to instructor or school desiring such equipment.

Information concerning the equipment may be had by addressing Mr. C. Edward Newell, Supervisor of Art and Handwork, Springfield, Mass.

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NEWS AND NOTES.

Change Date of Meeting. The meeting of the International Federation of Home Economics has been changed from July, 1921, to July, 1922, and the meeting place from Strasbourg to Paris.

American Meeting. The fourteenth annual meeting of the American Home Economics Association will be held at the New Ocean House, Swampscott, Mass., from June 27th to 30th.

Boys' Vocational Exhibit. The Boys' Vocational School of Albany held its annual exhibit from March 28th to April 2nd inclusive. In the display of the carpenter shop was included an office desk, a taboret, a typewriter stand, a checker-board, a windmill, a tie-rack, a bookrack and a costumer.

A Caterer's Club. The home economics class at Waupaca, Wis., has organized a caterer's club, the object of which is to serve the public and to act as catereresses and waitresses outside of school hours. Arrangements for the help of the girls are made thru the officers of the club and the students are paid 25 cents an hour for their work.

Laundry Lessons. The domestic science kitchen at De Pere, Wis., is equipped with a washing machine which is used for the washing of towels and for other laundry lessons.

High School Shops Undertake Sheet Metal. The vocational high school shops at Oakland, Calif., have undertaken the making of handy articles in sheet metal. Among the articles of practical use are garbage cans, pails, dust pans, machine tools, and blacksmith tools.

To Erect Vocational School. Steps have been taken for the erection of a new vocational school at Green Bay, Wis.

Increase Grant to Trade Schools. The Connecticut legislative committee on education has reported favorably a bill which calls for an expenditure of $13,000 more for the support of state trade schools.

Trade Schools Urged. The Wisconsin Board of Education has urged the development of vocational education thru the organization of local trade schools which shall have a close relation to the manufacturing industry of the community. It is pointed out that such a group of technical and trade schools, organized on a broad basis, and operated on a cooperative plan of alternate shop and school training, will enable students to earn while learning and prove of practical value to industry. The board recommends that a building-trades school be established at Madison, and a technical school of paper making at Appleton.

Teach Vocational Guidance. Newton, Mass., has established classes in occupations as a means of providing vocational guidance. The central office distributes literature on the trades and vocations; it also keeps the school census and work certificates and thus keeps in touch with the pupils who go into industry and with their progress in the work.

School Meets Local Conditions. A recent survey of the vocational school at Sheboygan, Wis., shows that an effort is made to connect the work of the school with the life and needs of the community. The city is a furniture manufacturing center and the school specializes in cabinet making. An effort has been made to develop skilled hand workers as the demand for handwork has become more insistent. A variety of drawing, mathematics and cultural work is urged, in order that the whole man may be developed, giving him opportunity to fit himself for industrial openings.

Construct Birdhouses. The manual training classes of the sixth, seventh and eighth grades at Fort Dodge, Ia., have completed 94 birdhouses. The houses are of a wide variety including bungalows, log cabins, cottages, and even apartment houses and garages. They range in size from the small ones for wrens, to the larger ones for twelve families. The houses sold locally at prices ranging from fifteen cents to $4. The work was done under the direction of Mr. J. M. Bice, instructor in grade work.

Intensive Work in English and Drafting. An intensive plan of work in English and drafting was inaugurated at the Boys' Vocational School, Newark, N. J., with the opening of the second semester. The intensive plan which seemed to offer a solution of the problem of disrupted in-

(Continued on Page XXXIII)

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(Continued from Page XXX)

struction, provided for the elimination of the alternate class system and the establishment of the interchange system.

Under the new plan, classes are divided into two groups, each composed of four classes. The first group consists of the advanced machine and woodwork classes, together with the elementary machine and printing classes. The unit or block reports to the English teacher and the second group composed of the advanced electricians and printers, together with the elementary group from the woodshop and electrical department, reports to the drafting instructor. The first group reports daily for English, but has no drafting; the second goes to the drafting class daily, but has no English. At the completion of a six weeks' period, the groups interchange.

Under the arrangement many advantages have been apparent to the school authorities. The boys are brought into closer contact with English by attending class daily and there is an increased power of expression which comes from intimate contact with the subject.

There is also greater continuity of instruction. An incomplete project may be finished the next day, while under the old plan the theme and content were abruptly disrupted during the time intervening between periods of instruction.

The results in drafting are said to parallel those in English. Thru class production charts comparison has been made with work of last year during a similar period of time. Results show a one hundred per cent increase in production with a marked improvement in quality. The power of visualization and constructive imagination have been developed during the drawing period, which was not the case under the alternating plan.

Another result of the plan has been that work is resumed the following day without the customary "warming-up" process at the opening of the class.

Schools Become Print Shops. Under a plan of Supt. E. A. Smith of Evanston, Ill., each grammar school is to possess a regular print shop. Printing equipment has been provided and the pupils will prepare and print the news matter.

Automobile mechanics is favored by the boys of Saint Louis, Mo., who have been asked to express their preference in taking up vocational studies. Machine shop work comes next and joinery with wood turning a close third. Printing has become popular with the high school boys.

The list of vocational subjects at Saint Louis, Mo., has now grown until every employed boy has a wide range for choice. It includes auto mechanics, bookkeeping, cabinet making, carpentry, commercial art, electrical work, machine shop practice, elementary mechanics, mechanical drawing, office practice, printing, sign painting, stenography, tailoring, typewriting, telegraphy and wood turning.

A home study course in textiles is offered by the Extension Department of Columbia University to meet the needs of buyers, salesmen, etc., of the wholesale and retail dry goods, etc., who find they lack a knowledge of selling points of textiles. The manufacture of textiles, the raw materials, yarn manufacture, weaving, dyeing and finishing of fabrics, a change in any or all of which makes a difference in the fabric, will be studied.

This knowledge which is imperative in selling textiles cannot be obtained alone by reading books but by a systematic study of the fabrics themselves, under the guidance of the instructor. The course provides such instruction in the form of lesson sheets with samples of fabrics, etc. Questions may be asked the instructor. The course is planned to furnish students with sufficient knowledge to describe, identify and test all kinds of textiles and thereby have a grasp of the selling qualities of a fabric.

New Courses at West Technical High School, Salt Lake City, Utah. The Mechanic art department of the West High School has outlined a number of courses to be offered in the school as soon as the new wings are completed at the building. Three-year vocational courses, with related subjects, drawing and design are offered. The courses cover twenty periods a week and the instruction is given four periods each day. Among the subjects covered in the courses are cabinet making, pattern making, forge work, foundry practice, acetylene welding, machine shop and automobile construction, mechanical drawing.

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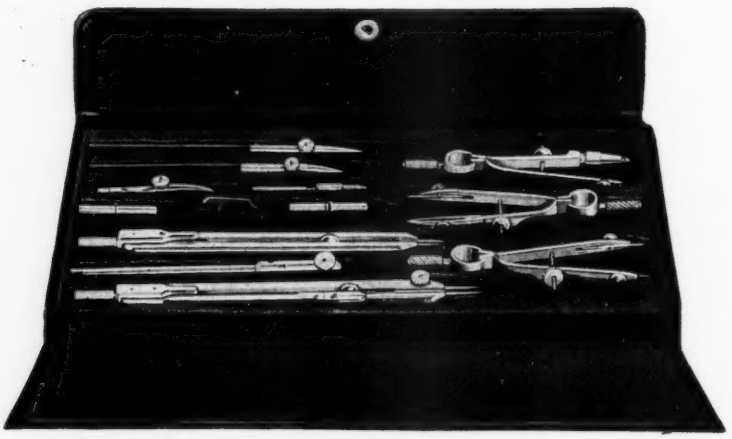

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PERSONAL NEWS.

Mr. C. A. Zuppan, formerly with the Federal Board of Vocational Education, has been made head of the school placement bureau of Minneapolis. The bureau has recently become affiliated with the federal employment service.

Mr. R. H. White has been appointed director of industrial rehabilitation work in the state of Tennessee. Mr. White is a graduate of Vanderbilt University and was for some time teacher of English at the Middle Tennessee Normal. For the past two years he has been supervisor of rehabilitation work in Tennessee, Florida, Georgia and the Carolinas.

Mr. H. A. Underhill has become instructor in manual training at the Converse County (Wyo.) high school.

Mrs. Ruth E. Kramer of Missoula, Mont., has been appointed a member of the executive board of the state vocational school for girls, located in the Helena Valley.

Mr. Carl Warner has been elected printing instructor at Butte, Mont.

Mr. Oscar Shaw has been made head of the vocational department in the city schools of Bellingham, Wash.

Mrs. Harriet Brown has been elected as supervisor of art and elementary manual training at Bellingham, Wash.

Mr. George Henry Jensen has resumed the work of Supervisor of Trades and Industries for the State Board of Vocational Education after having put in the winter quarter at the University of Washington.

Mr. A. R. Nichols of Corvallis, Ore., has been appointed supervisor of trades and industries for the State Board of Vocational Education. Mr. Nichols has for some time been connected with the vocational department of the Oregon Agricultural College as instructor in industrial education.

Mr. Nichols will have charge of the organization and administration of industrial work conducted by the state board. He will supervise the trade and industrial departments located in the high schools at Eugene, Salem, Pendleton, and The Dalles, which offer instruction in machine shop work, carpentry, printing, plumbing and the building trades. In addition he will have direction of the trade extension and part-time industrial schools which provides for an enlarged program for the coming year.

Mr. P. H. Oquist has been engaged as instructor in the cabinet department at the Vocational Continuation School, Sheboygan, Wis.

Mr. W. F. Van Buskirk has become Director of the Vocational School, at Waterford, Pa., to succeed Mr. Gehr.

Mr. Wm. A. DeVette of Muskegon, Mich., has been appointed instructor in practical drafting in the Lincoln Junior High School, Erie, Pa. Mr. DeVette has completed two years' work in mechanical engineering at the Michigan Agricultural College and has had several years of practical experience as draftsman and tool designer.

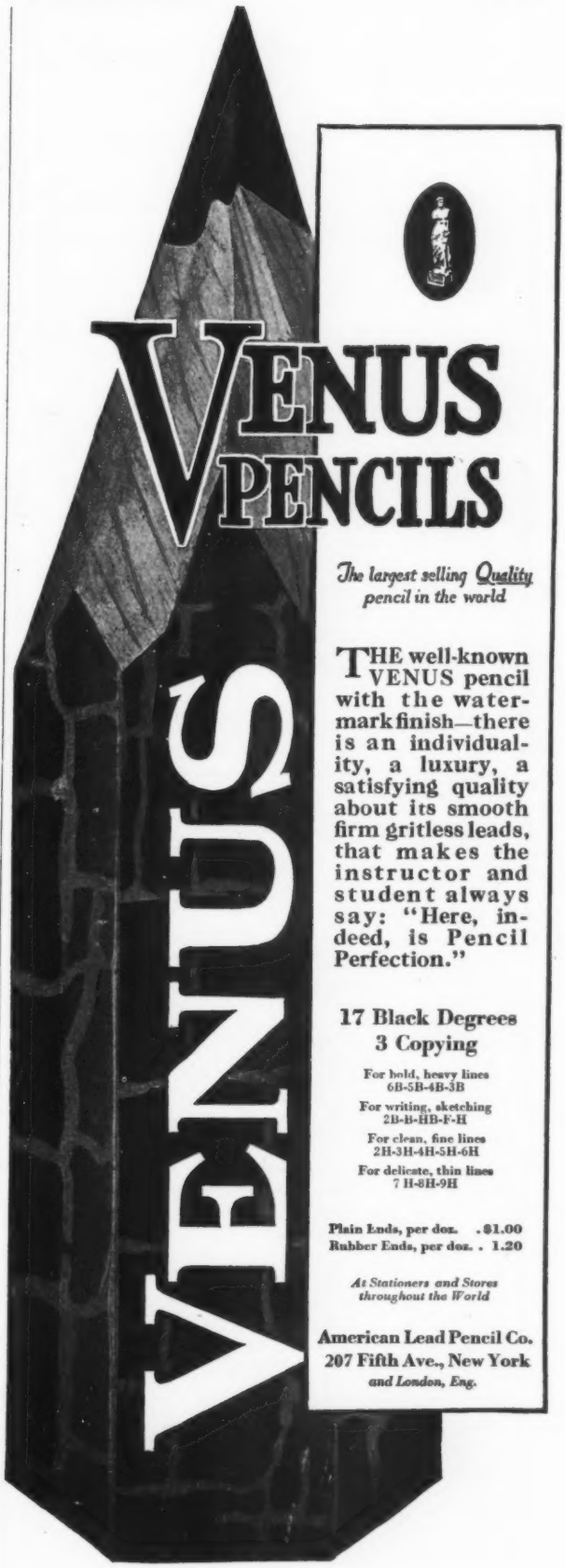
Mr. T. F. Kinney has been engaged to teach printing and woodwork at the Andrew Jackson School, Erie, Pa.

Mr. H. F. Goldmeier has been appointed instructor in electrical construction at the Jackson Shop Center, Erie, Pa.

C. K. Harris, formerly supervisor of Manual Training at Leavenworth, Kansas, is now in charge of the Electrical and Woodworking classes of the Part-time School at Kansas City, Missouri.

Chas. A. Barrett has been transferred from the regular Manual Training department of the Karnes School to have charge of printing and mechanical drawing in the Part-time School.

Mr. Frank Cushman, principal of the Lathrop Trade School of Kansas City, Missouri, has resigned to accept a position as Regional Director of the North Atlantic States for the Federal Board of Vocational Education. Mr. Cushman was a Regional Director before he became the principal of Lathrop Trade School, having his territory in the middle west. They also feel the loss of such a man as Mr. Cushman from among their number. They wish him God speed and success in his new position and he will ever be welcome to his "home town". Mr. Cushman before he became a regional held several responsible positions in Kansas City, he was Vice-Principal of the Manual Training High School, also had charge of the vocational work at the Polytechnic Institute for a time.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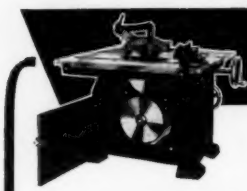

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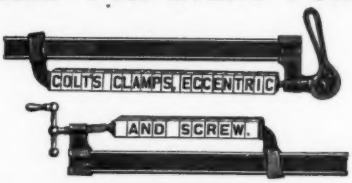

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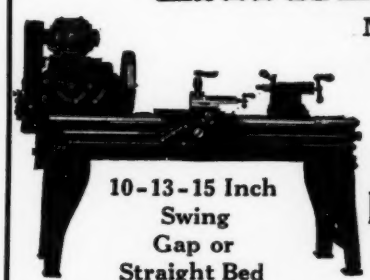

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DEATH OF MR. SMITH.

Mr. Thomas L. Smith, founder, director and chief stockholder of the T. L. Smith Company, died on April 29th at his home, Milwaukee, Wis.

Mr. Smith was graduated from the Iowa State College in 1877 and immediately became an instructor in mathematics and bookkeeping. After several years he went to Boston, where he completed his engineering education in the Massachusetts Institute of Technology. In 1920 the Iowa State College conferred the honorary degree of Doctor of Engineering in recognition of his accomplishments.

Mr. Smith was especially interested in the manufacture of concrete mixers, and he brought out a number of successful inventions in mixers, pavers, excavators, and crushers. Mr. Smith had a controlling interest in the Sterling Wheelbarrow Company of West Allis and was also responsible for the organization and development of the Smith Engineering Works of Milwaukee.

A NEW JUNIOR JACK PLANE.

The Stanley Rule and Level Company has recently put on the market a new junior jack plane known as No. 5¼. The tool has been developed as a result of suggestions made by manual training teachers and is especially valuable for use in manual training shops where a number of special uses are to be made. The plane can be used for smoothing as well as jointing purposes. While it has been on the market since January 1st, many schools have already been equipped with it.

It is quite interesting to know that while the plane is a manual training project, it has been found especially desirable for patternmakers, jobbing carpenters and home workers. The plane is 11½ inches long and has a 1¾ inch cutter. It is in stock in leading hardware stores.

A CATALOG OF BASKETRY MATERIALS.

"Everything for Basket Making" is the suggestive title of a catalog just issued by Louis Stoughton Drake, of Boston, Mass.

The catalog contains 65 pages devoted to reeds, chair-cane and basketry materials which the firm manufactures for the reed-using industries. In addition to materials, the firm also carries a good line of tools, wooden beads, dyes, enamel paint, wooden bases for baskets of various kinds, candle-stick and lamp frames, brass handles, glass for wooden bases, and a list of well-known practical books for the making of baskets. The booklet is profusely illustrated to give the user a good idea of the appearance of the finished articles.

Teachers and supervisors who are interested in the subject of basket making and cane weaving may obtain a copy of the catalog at the small price of fifteen cents.

Vocational Work Grows in Oregon. On April first ninety men and one woman were receiving vocational training under the state industrial accident commission of Oregon. Eleven of these had finished their courses and nine others had dropped out of the work. It is estimated that 88 of the men injured in accidents are entitled to relief in order that they may engage in business or secure other means of earning a living. In all cases, the training commission takes advantage of existing schools, including trade schools, universities, agricultural colleges and other institutions.

Furniture Made by Students. The students of the manual training class in the Vocational High School, at Beach, N. D., have completed a series of furniture projects including dressers, chiffonettes, cedar chests and library tables. The work represents the results of the year in cabinet making. The class also did some practical work in lathing and finishing on the third floor of the building. Mr. S. E. Strand is director of manual training and shopwork.

Bruce's Latest Publications

Rope Work

By LOUIS M. ROEHL
Supervisor of Farm Shop Work,
New York College of Agriculture,
Cornell University, Ithaca, N. Y.

This book covers the fundamental principles of rope work in a most specific, simple and thorough manner. Its contents deal with the various grades of rope; how to make splices and hitches; how to tie the many different knots, finish ends, etc. It is profusely illustrated and contains numerous suggestions as to the most efficient and economical use of rope, which is a valuable asset to boys in the rural communities.

Boards, 47 pages—Price, 80 cents, net.

Harness Repairing

By LOUIS M. ROEHL

This book covers every phase of harness repairing in a most simple and thorough manner. It describes and illustrates how best to make ordinary and emergency harness repairs and tells how to clean and oil the harness in order to keep it in good condition. Illustrated with numerous photographs and with working drawings for a Workbench, Harness Stitching Clamp, Stitching Horse, etc.

Cloth, 54 pages—Price $1.00, net.

Handcraft Projects

By FRANK I. SOLAR
Detroit, Mich.

A series of valuable elementary problems in woodworking arranged in handy card form for the school and home shop. The series has been developed from the author's long experience as a teacher of manual training and as a designer of toys and furniture to be made by boys. It includes only such problems as have been found to interest boys keenly, to involve a wide variety of tool processes and to require easily obtained and economical materials.

Six sets, ten problems each. Price, 35 cents per set, postpaid.
In Preparation in Book Form.

Problems in Woodwork

New Enlarged and Revised Edition
By EDWARD F. WORST
Supervisor of Elementary Manual Training and Construction Work, Chicago, Illinois.

A most complete collection of problems in combination with various other materials, for the three upper grades of the elementary school or for the junior high school. Leading experts have pronounced this book to be the most original and valuable of its kind offered in the past twenty years.

Cloth, 246 pages—Price, $2.50, net.

ADVANCE ANNOUNCEMENT
TWO NEW BOOKS

Elementary Concrete Work

By LEON A. BAXTER
Supervisor of Manual Training,
St. Johnsbury, Vt.

This book covers in detail, the art of making, laying and successfully working out problems in concrete. The author, knowing the scarcity of material, of an elementary nature, on the subject of concrete construction, has gathered together this series of problems in concrete, which have been successfully worked out by pupils in the seventh and eighth grades, and which have demonstrated the practical application of concrete to elementary work.

Advance orders now being accepted.

Pasteless Paper Construction

By MISS S. E. E. HAMMOND
Springfield, Mass.

This book contains a complete collection of problems in pasteless paper construction. It describes and illustrates how to make many interesting things with paper, eliminating the paste. The aim of this work is to primarily secure accuracy in measuring, either by ruler or eye, and exactness in handling; to develop initiative and invention; to promote pleasure in the work and its correlation, and to increase the appreciation of beauty and simplicity. The book can be used with equal success in both rural and city schools.

Advance orders now being accepted.

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